Environmental Protection Division
Water Quality & RCRA Group (ENV-RCRA)
P.O. Box 1663, M704
Los Alamos, New Mexico 87545
(505) 667-0666/FAX (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: November 16, 2011
Refer To: ENV-RCRA-11-0251
LAUR: 11-11960

Ms. Hannah Branning
U.S. Environmental Protection Agency, Region 6
Water Quality Protection Division
Planning and Analysis Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

1 - Permit/CD
2 - AO & AO matl
3 - DMR's
4 - Vio. Sum. Log
5 - NCR
6 - Correspondence
7 - CRA
Date Filed 11/22/2011
Clerk's Inits.

Dear Ms. Branning:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) at Los Alamos National Laboratory (the Laboratory) requires the permittees to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged (see Part III.D.1.a. *Reporting Requirements*).

The purpose of this letter is to notify EPA of changes to the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF) process schematic previously submitted with the Notice of Planned Change, dated September 28, 2011 (reference ENV-RCRA-11-0204). The changes include re-naming the two reverse osmosis treatments to "Primary" Reverse Osmosis (formerly Reverse Osmosis) and "Secondary" Reverse Osmosis (formerly Sea Water RO), and the addition of comments explaining that treatments paths can differ depending upon water quality. This notification is being provided for clarification purposes only, even though neither of these name changes will change the nature of or increase the quantity of pollutants discharged at NPDES Outfall 051. Enclosed for your review is a revised schematic for the treatment of wastewater received at RLWTF (Enclosure 1). The revisions have been highlighted.

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality and RCRA Group (ENV-RCRA) if you have questions.

Sincerely,

for Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group
Los Alamos National Security, LLC

Sincerely,

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

ARG:GET:MB/lm

Cy: Isaac Chen, USEPA/Region 6, Dallas, TX, w/enc.
James Bearzi, NMED/SWQB, Santa Fe, NM, w/enc.
Jerry Schoeppner, NMED/GWQB, Santa Fe, NM, w/enc.
Jim Davis, NMED/RPD, Santa Fe, NM, w/enc.
George Rael, LASO-EO, w/enc., A316
Steve Yanicak, LASO-GOV, w/enc., M894
Carl A. Beard, PADOPS, w/o enc., AI02
Michael T. Brandt, ADESH, w/o enc., K491
Vincent P. Worland, TA-55-RLW, w/enc., E518
Chris Del Signore, TA-55-RLW, w/enc., E518
Mike Saladen, ENV-RCRA, w/o enc., K490, (E-File)
Marc Bailey, ENV-RCRA, w/enc., K490, (E-File)
Bob Beers, ENV-RCRA, w/enc., K490, (E-File)
ENV-RCRA File, w/enc., M704
IRM-RMMSO, w/enc., Al50

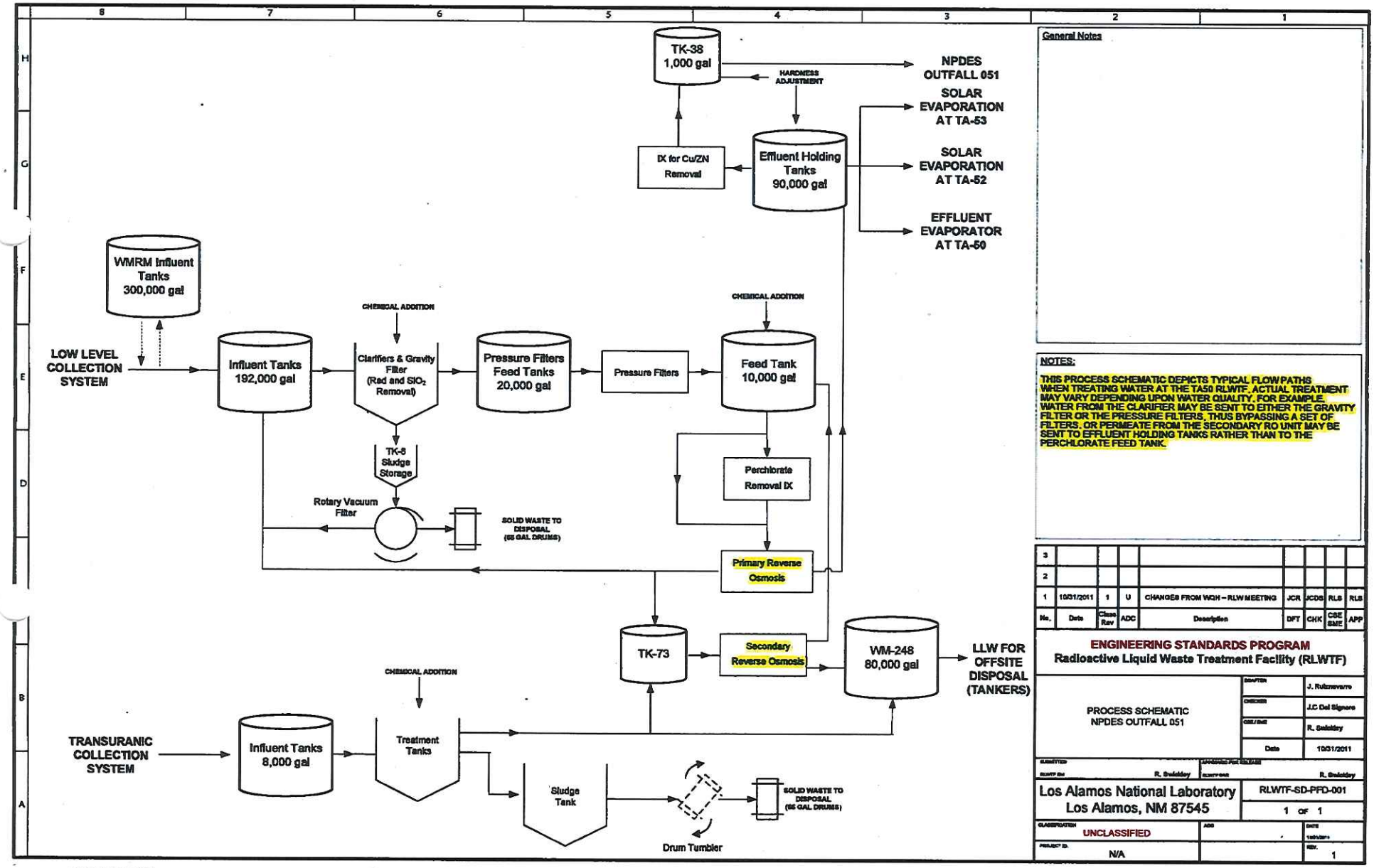
ENCLOSURE 1

Notice of Planned Change
NPDES Permit No. NM0028355

Outfall 051
Process Schematic Revision 11-14-2011

ENV-RCRA-11-0251

LAUR-11-11960



General Notes

NOTES:

THIS PROCESS SCHEMATIC DEPICTS TYPICAL FLOW PATHS WHEN TREATING WATER AT THE TA50 RLWTF. ACTUAL TREATMENT MAY VARY DEPENDING UPON WATER QUALITY. FOR EXAMPLE, WATER FROM THE CLARIFIER MAY BE SENT TO EITHER THE GRAVITY FILTER OR THE PRESSURE FILTERS, THUS BYPASSING A SET OF FILTERS. OR PERMEATE FROM THE SECONDARY RO UNIT MAY BE SENT TO EFFLUENT HOLDING TANKS RATHER THAN TO THE PERCHLORATE FEED TANK.

No.	Date	Class Rev	ADC	Description	DFT	CHK	CSE SME	APP
3								
2								
1	10/31/2011	1	U	CHANGES FROM WQH – RLW MEETING	JCR	JCDS	RLS	RLS

ENGINEERING STANDARDS PROGRAM
Radioactive Liquid Waste Treatment Facility (RLWTF)

PROCESS SCHEMATIC
NPDES OUTFALL 051

DRAFTER	J. Ruizmevarre
CHECKED	J.C Del Signore
CSE / SME	R. Swieldey
Date	10/31/2011
SUBMITTED	R. Swieldey
APPROVED FOR RELEASE	R. Swieldey

Los Alamos National Laboratory
Los Alamos, NM 87545

RLWTF-SD-PFD-001

1 OF 1

CLASSIFICATION: UNCLASSIFIED

PROJECT ID: N/A

REV. 1

ENV-RCRA-11-0251

11-11960

NPDES Permit No. NM0028355, LANL Notice of Planned Change, NPDES Outfall 051

Saladen, Michael T to: Hannah Branning, richard.powell@state.nm.us, Jennifer.Fullam@state.nm.us — 11/23/2011 04:37 PM

Cc: "saladen_michael_t@lanl.gov", "Bailey, Marc A", "Beers, Robert S"

From: "Saladen, Michael T" <saladen@lanl.gov>

To: Hannah Branning/R6/USEPA/US@EPA, "richard.powell@state.nm.us" <richard.powell@state.nm.us>, "Jennifer.Fullam@state.nm.us" <Jennifer.Fullam@state.nm.us>

Cc: "saladen_michael_t@lanl.gov" <saladen_michael_t@lanl.gov>, "Bailey, Marc A" <marc@lanl.gov>, "Beers, Robert S" <bbeers@lanl.gov>

1 attachment

NPDES Notice of Planned Change, Outfall 051.pdf

Hannah,

Attached is a Notice of Planned Change for the LANL Radioactive Liquid Waste Treatment Facility (RLWTF), NPDES Outfall 051. Please call if you have questions. Thanks!!!

Mike

Los Alamos
NATIONAL LABORATORY
EST. 1943

Environmental Protection Division
Water Quality & RCRA Group (ENV-RCRA)
P.O. Box 1663, M704
Los Alamos, New Mexico 87545
(505) 667-0666/FAX (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: October 19, 2011
Refer To: ENV-RCRA-11-0233
LAUR: 11-11765

1 - Permit/CD
2 - AO & AO matl
3 - DMR's
4 - Vio. Sum. Log
✓ 5 - NCR
6 - Correspondence
7 - CRAS
Date Filed 11/6/11
Clerk's Inits.

Ms. Hannah Branning
U.S. Environmental Protection Agency, Region 6
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Dear Ms. Branning:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NO. NM0028355, QUARTERLY PROGRESS REPORT (JULY 1, 2011 – SEPTEMBER 30, 2011)

The NPDES Permit No. NM0028355 issued to the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) for the Los Alamos National Laboratory requires the permittees to submit quarterly progress reports to the U. S. Environmental Protection Agency (EPA) regarding the status of attainment of the state water quality standards–based effluent limits. This letter and Enclosure 1 serves as the seventeenth Quarterly Progress Report for the performance period July 1, 2011 – September 30, 2011. The information in Enclosure 1 was provided by the responsible managers for each activity.

Please contact Mike Saladen, LANS at (505) 665-6085 or Gene Turner, NNSA at (505) 667-5794 if you need additional information concerning the status of the Laboratory's corrective action activities.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group
Los Alamos National Laboratory

Sincerely,

Gene E Turner

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

ARG:GET:MS/lm

Enclosure: a/s

Cy: Richard Powell, NMED/SWQB, Santa Fe, NM, w/enc.
George Rael, LASO-EO, w/enc., A906
Gene Turner, LASO-EO, w/enc., A316
Juan Griego, LASO-NSM, w/enc., A316
Isaac Valdez, LASO-NSM, w/enc., A316
Carl A. Bear, PADOPS, w/o enc., A102
J. Chris Cantwell, ADESHQ, w/o enc., K491
Ken Schlindwein, IP-DO, w/enc., M895
Craig Leasure, PADWP, w/enc., A107
Craig Bachmeier, IPM-4, w/enc., J520
Jeffrey Schroeder, SP-PGIU, w/enc., J590
Mike Saladen, ENV-RCRA, K490, w/enc., (E-File)
Marc Bailey, ENV-RCRA, K490, w/enc., (E-File)
Albert Dye, ENV-RCRA, K490, w/enc., (E-File)
Robert Wingo, C-CDE, w/enc., J964
Cindy Blackwell, LC-LESH, w/enc., A187
ENV-RCRA File, w/enc., M704
IRM-RMMSO, w/enc., A150

ENCLOSURE 1

The Permittees have divided facilities into five stand alone projects (groups). A summary of each group is provided below:

Group 1:

- Sanitary Reclamation Recycling Facility (SERF)/TA-46 Sanitary Wastewater System (SWWS), Outfall 13S: LANS received capital money in mid-February 2011. The Request for Proposal (RFP) for a Design Build contract went out February 23, 2011. The pre-bid meeting was held on March 8, 2011 and bids were due mid-April. LANS received approval to order long lead equipment on June 13, 2011. The SERF site survey was completed on June 15th and the "Full Notice To Proceed" was issued on July 11, 2011. The Building Foundation and Structural Steel Design Package was 60% complete on July 13, 2011. On July 14, 2011, the Main Process 60% Design Package was 17% complete and the Mass Excavation 60% Design Package was 20% complete. In August 2011, LANS provided treated SERF wastewater to the Strategic Computing Complex (SCC) cooling tower for a 24 hour/day operational run. LANS also conducted operational runs of a half hour or less in August 2011 to check out valves, pressures, etc. LANS collected operational samples for PCB congeners to evaluate the treatment efficiencies during the August operational runs. Data is currently undergoing data validation. LANS is preparing contingency plans if the SERF project is delayed and working with vendors to determine which products could meet the PCB treatment requirements.

- TA-3 Power Plant, Outfall 001: The boiler blow-down was re-plumbed to the TA-46 SWWS Plant. The Power Plant has limited generation to ensure discharges meet temperature limits. Modifications necessary to cool water below discharge limits are in place. The sump in the Power Plant basement was drained, cleaned, and an impervious epoxy liner was installed the week of August 22-26, 2011.

- Strategic Computing Complex (SCC) and the Laboratory Data Communication Center (LDCC) Cooling Towers, (03A027 and 03A199, respectively): The SCC and LDCC cooling tower outfalls do not have metals or PCB compliance issues.

  On March 22, 2011 NNSA/LANS representatives requested an NPDES permit change for Outfalls 03A027, 03A113, and 03A199 to allow treated SERF effluent to be discharged through Outfall 03A027. On May 13, 2011 EPA Region 6 issued a minor modification to NPDES Permit No. NM0028355. The minor modification changed permit language to Footnote*1 on Page 18 of Part I of the LANS/NNSA permit. The language in the footnote was changed from "(Effluent from Outfall 13S shall not be discharged at Outfall 03A027 if such effluent contains detectable PCBs.)" to "(Effluent from Outfall 13S shall not be discharged at Outfall 03A027 if

ENCLOSURE 1

such effluent contains detectable PCBs above effluent limitations established for Outfall 13S.)". This language allows for the reuse of treated SERF wastewater in the SCC cooling tower. NNSA/LANS will be required to monitor and report PCB effluent quality from Outfall 03A027 in the monthly discharge monitoring reports (DMRs). Additionally, the Permittees are required to meet interim effluent limits (0.009 ug/l) for total PCBs until the SERF Expansion Project is completed. NNSA/LANS will be required to meet the water quality standard for total PCBs (0.00064 ug/l) when the permit limit becomes effective on August 1, 2012.

Group 2:

- Radioactive Liquid Wastewater Treatment Facility (RLWTF), Outfall 051: The RLWTF has completed numerous changes at the facility to comply with the very stringent zinc and copper limits that went into effect on August 1, 2010. The most recent Notice of Planned Change for RLWTF was submitted on September 28, 2011. The September 28th notice provided information regarding the operational use of perchlorate ion exchange units, design of a seawater reverse osmosis treatment unit to replace the existing waste evaporator, and provided updated information about the installation of zero liquid discharge (ZLD) tanks.

  On March 2, 2010 NNSA/LANS submitted the Final Report on Toxicity Reduction Evaluation (TRE) activities at RLWTF for failed whole effluent toxicity (WET) tests. The Permittees previously submitted the TRE Action Plan and Schedule on January 31, 2008 and provided quarterly status reports to EPA. On March 22, 2011 LANS, NNSA and EPA representatives discussed the facility's WET test results in great detail. LANS representatives discussed corrective actions completed to address metals toxicity, and potential strategies for identifying non-metalic toxicity. On March 28, 2011 NNSA/LANS provided an update on the evaluation of technologies for the removal of toxicity caused by organics in the RLWTF effluent. The March 28th letter outlined a path forward for potential corrective actions, including timelines for completion. A follow up conference call with EPA, LANS and NNSA representatives was conducted on June 15, 2011. Based on EPA guidance, the Permittees will continue working with EPA staff to develop a protocol for "hardness" to be restored to the WET tests performed on operational or compliance aqueous samples from the RLWTF. The "hardness" will be restored to the levels found in the tap water at the Laboratory, which is typically 50 mg/L (expressed as calcium carbonate). Once this protocol is finalized, WET tests on RLWTF aqueous samples will be performed with the "hardness" restored to the 50 mg/L level. WET test results with the "hardness" restored in the sample will be compared to WET test results in samples that did not have the "hardness" restored. If the restoration of "hardness" in the WET test samples is shown to reduce the toxicity, then a protocol

ENCLOSURE 1

will be developed to restore "hardness" in the RLWTF effluent water. Using this protocol "hardness" will be restored to the RLWTF effluent on RLWTF operational and compliance effluent samples, having the "hardness" restored, will then be evaluated. EPA approved these corrective actions on June 21, 2011.

TA-55 Cooling Towers, Outfall 03A181: Design work to tie in the cooling tower effluent to the SWWS or SERF cross country line is underway.

- TA-35 National High Magnetic Field Laboratory (NHMFL) Cooling Tower, Outfall 03A160: An ion exchange system has been installed and the system is treating water. Effluent water samples have been taken and analysis indicates the effluent is well below permitted discharge limits. The metals interim measure is considered complete. NHMFL is currently evaluating a strategy to eliminate the blow-down discharge to the environment, by connecting the cooling tower to the SWWS facility.

Group 3:

- TA-53 LANSCE Cooling Tower, Outfall 03A048: An alternatives analysis for a final remedy solution to eliminate discharges at LANSCE was completed on July 23, 2011. The objective of the Technical Area (TA)-53 Zero Liquid Discharge (ZLD) Project Engineering Study was to evaluate options for cooling tower water treatment to achieve greater water conservation and to achieve ZLD. Currently, the limiting factor to cooling tower water conservation at LANL is the high silica concentration in source water that becomes insoluble and plates out on heat transfer surfaces, and causes fouling of equipment.

  Four ZLD treatment strategies were evaluated. These options included: chemical precipitation, filtration, and reverse osmosis conditioning of cooling tower blow-down water followed by blending the treated water with well water; chemical cooling tower blow-down water followed by blending the conditioning of well water prior to the cooling tower; and, two options using different types of filtration and softening employed on the well water prior to reverse osmosis conditioning. Each option evaluated during this study considered the reuse of water currently being discharged to outfalls, and treatment of the water to remove silica so that the cooling towers can operate more efficiently.

  The preferred alternative for a TA-53 Water Treatment Facility or LANSCE Cooling Water Treatment Facility (LCWTF) combines nano-filtration (membrane softening) with reverse osmosis to remove hardness, silica, and excess total dissolved solids and minimize the required flow capacity of the LCWTF by reducing the blow-down volumes from the cooling towers as a result of improved makeup water quality. This alternative uses fewer chemicals and produces less solid waste than the options using

ENCLOSURE 1

chemical precipitation. Additionally, the preferred alternative was the most cost-effective solution based on capital cost of process equipment and operation and maintenance costs. However, the cost is significant at greater than $20M to construct and yearly operation and maintenance costs of approximately $800K. At this time, there is no funding available to proceed.

Group 4:

- Chemistry and Metallurgy Research (CMR) Air Washers, Outfall 03A021: The final remedy for the CMR is complete. EPA officially deleted NPDES Outfall 03A021 from the NNSA/LANS permit on October 11, 2011.

- Sigma/Beryllium Test Facility Cooling Towers, Outfall 03A022: All construction activities are complete and the system is treating water. The metals interim measure is considered complete. Additionally, the Sigma facility has finalized a design to reroute the cooling tower blow-down to SWWS. Waiting for LANS management approval prior to making final physical modifications. Estimated completion date is the end of the calendar year to alleviate freeze concerns from the temporary modification. In the out years, the Sigma facility will initiate a feasibility study for the replacement and/or modification of existing cooling tower to increase efficiency.

  A compliance sample was collected at NPDES Outfall 03A022 at 10:33a.m. on July 14, 2011. The validated total copper result (received from the analytical laboratory on July 27, 2011) from the monthly outfall compliance sampling event was 0.138 mg/L. This result exceeded the daily maximum permit limit of 0.028 mg/L. The discharge was temporarily rerouted from the interim ion exchange treatment unit directly to the outfall on July 25, 2011. The permanent solution is to route the blow down from the Sigma cooling tower to the SWWS as designed in the Outfall Reduction Program. Additionally, the float on the interior basement sump has been re-set to prevent overflow into the outfall pipe when the building cooling system calls for make-up water.

Group 5:

- TA-15 Dual-Axis Radiographic Hydrodynamic Test (DARHT) Cooling Tower/Septic Effluent, Outfall 03A185: The DARHT cooling tower and facility septic system were connected to the TA-46 SWWS collection system. EPA officially deleted NPDES Outfall 03A185 from the NNSA/LANS permit on October 11, 2011.

ENCLOSURE 1

Other Activities:

- TA-11 Cooling Tower, Outfall 03A130: The project was completed on April 30, 2010. EPA officially deleted NPDES Outfall 03A130 from the NNSA/LANS permit on October 11, 2011.

- PCB Mitigation Update: The permittees have an ongoing program to remove and replace old equipment containing PCBs. There is still some equipment present that may contain oil with low levels of PCBS at non-regulated concentrations. As a mitigating action to reduce the potential for oil from old equipment being discharged to the sanitary collection system from building floor drains, LANS purchased and distributed Petro Plug devices to selected facilities. These cylindrical devices, when placed into a floor drain selectively absorb oil while allowing water to pass through the drain. In addition, Laboratory personnel conducted a walk-through inspection of selected buildings at TA-53 to identify locations where oil leaks could accidently be discharged to the sanitary collection system. Selected building drains were identified for possible PCB swipe sampling.

- Program Budgets Authorized, to date: Outfall Reduction at the Laboratory has authorized up to $15.2M for the projects identified above, not including the SERF Expansion Project (SERF-E). SERF-E has been authorized at $1.1M in preparatory funding to date and new Line Item budget authorization has been authorized for Fiscal Year (FY) 11 funding at $15M.

- Outfall Reduction Program: The Permittees have continued to work on eliminating outfalls and reducing effluent discharges to the environment. NNSA/LANS requested the elimination of NPDES Outfalls 02A129, 03A021, 03A130, and 03A185 from the NPDES permit. Formal notification was submitted to EPA. These outfalls were officially deleted from the NNSA/LANS permit on October 11, 2011. Based on proposed SERF Expansion project, the NNSA/LANS will significantly reduce flows at Outfalls 001, 03A022, 03A027, and 03A160 by recycling treated effluent. Outfalls 05A055, 13S, and 051 have the potential to become no-flow outfalls but will remain in the NPDES permit.

- NPDES Re-Application: Section 402 of the federal Clean Water Act, requires the Permittees to obtain a new NPDES Outfall Permit every five years. The current NPDES permit issued to NNSA/LANS became effective August 1, 2007 and will expire July 31, 2012. The Permittees are required to submit a new application 180 days prior to expiration of the existing permit. NNSA/LANS estimate that the NPDES Re-Application will be submitted to EPA in January 2012. In June 2011, ENV-RCRA personnel conducted NPDES Re-Application kick off meeting with

ENCLOSURE 1

outfall owners and facility representatives. Actions completed to date include: NPDES records and process reviews, review of operation and historical compliance sample results, kick off meetings with NPDES facility owners, and site tours. The Permittees plan to meet with EPA and NMED to review the draft application document in November 2011.

- Zero Liquid Discharge (ZLD) Tanks Project: As previously discussed, Permittees have completed numerous changes at the RLWTF to comply with the very stringent zinc and copper limits. The RLWTF is planning to construct new concrete evaporation tanks at Technical Area 52 to receive fully treated radioactive liquid effluent from RLWTF. These tanks are being constructed to reduce the volume of treated effluent being discharged through NPDES Outfall 051. The construction will also allow for passive evaporation of treated RLWTF effluent. NNSA/LANS submitted a Notice of Planned Change to EPA in May 2007 regarding the construction of the ZLD Tanks. Estimated schedule dates for the ZLD Tanks Subproject are provided below:

  - July 2011: 60% Design
  - August 11, 2011: 90% Design
  - August 15, 2011: Start Construction
  - January 25, 2012: Complete Construction
  - January 26, 2012: Begin Start-up & Testing
  - February 16, 2012: Pre-final Inspection
  - March 1, 2012: Final Inspection

Los Alamos
NATIONAL LABORATORY
EST. 1943

Environmental Protection Division
Water Quality & RCRA Group (ENV-RCRA)
P.O. Box 1663, M704
Los Alamos, New Mexico 87545
(505) 667-0666/FAX (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: October 19, 2011
Refer To: ENV-RCRA-11-0233
LAUR: 11-11765

Ms. Hannah Branning
U.S. Environmental Protection Agency, Region 6
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Dear Ms. Branning:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NO. NM0028355, QUARTERLY PROGRESS REPORT (JULY 1, 2011 – SEPTEMBER 30, 2011)

The NPDES Permit No. NM0028355 issued to the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) for the Los Alamos National Laboratory requires the permittees to submit quarterly progress reports to the U. S. Environmental Protection Agency (EPA) regarding the status of attainment of the state water quality standards–based effluent limits. This letter and Enclosure 1 serves as the seventeenth Quarterly Progress Report for the performance period July 1, 2011 – September 30, 2011. The information in Enclosure 1 was provided by the responsible managers for each activity.

Please contact Mike Saladen, LANS at (505) 665-6085 or Gene Turner, NNSA at (505) 667-5794 if you need additional information concerning the status of the Laboratory's corrective action activities.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group
Los Alamos National Laboratory

Sincerely,

Gene E Turner

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

ARG:GET:MS/lm

Enclosure: a/s

Cy: Richard Powell, NMED/SWQB, Santa Fe, NM, w/enc.
George Rael, LASO-EO, w/enc., A906
Gene Turner, LASO-EO, w/enc., A316
Juan Griego, LASO-NSM, w/enc., A316
Isaac Valdez, LASO-NSM, w/enc., A316
Carl A. Beard, PADOPS, w/o enc., A102
J. Chris Cantwell, ADESHQ, w/o enc., K491
Ken Schlindwein, IP-DO, w/enc., M895
Craig Leasure, PADWP, w/enc., A107
Craig Bachmeier, NPI-8, w/enc., J520
Jeffrey Schroeder, MOF-PM4, w/enc., J590
Mike Saladen, ENV-RCRA, K490, w/enc., (E-File)
Marc Bailey, ENV-RCRA, K490, w/enc., (E-File)
Albert Dye, ENV-RCRA, K490, w/enc., (E-File)
Robert Wingo, C-CDE, w/enc., J964
Cindy Blackwell, LC-LESH, w/enc., A187
ENV-RCRA File, w/enc., M704
IRM-RMMSO, w/enc., A150

ENCLOSURE 1

The Permittees have divided facilities into five stand alone projects (groups). A summary of each group is provided below:

Group 1:

- Sanitary Reclamation Recycling Facility (SERF)/TA-46 Sanitary Wastewater System (SWWS), Outfall 13S: LANS received capital money in mid-February 2011. The Request for Proposal (RFP) for a Design Build contract went out February 23, 2011. The pre-bid meeting was held on March 8, 2011 and bids were due mid-April. LANS received approval to order long lead equipment on June 13, 2011. The SERF site survey was completed on June 15th and the "Full Notice To Proceed" was issued on July 11, 2011. The Building Foundation and Structural Steel Design Package was 60% complete on July 13, 2011. On July 14, 2011, the Main Process 60% Design Package was 17% complete and the Mass Excavation 60% Design Package was 20% complete. In August 2011, LANS provided treated SERF wastewater to the Strategic Computing Complex (SCC) cooling tower for a 24 hour/day operational run. LANS also conducted operational runs of a half hour or less in August 2011 to check out valves, pressures, etc. LANS collected operational samples for PCB congeners to evaluate the treatment efficiencies during the August operational runs. Data is currently undergoing data validation. LANS is preparing contingency plans if the SERF project is delayed and working with vendors to determine which products could meet the PCB treatment requirements.

- TA-3 Power Plant, Outfall 001: The boiler blow-down was re-plumbed to the TA-46 SWWS Plant. The Power Plant has limited generation to ensure discharges meet temperature limits. Modifications necessary to cool water below discharge limits are in place. The sump in the Power Plant basement was drained, cleaned, and an impervious epoxy liner was installed the week of August 22-26, 2011.

- Strategic Computing Complex (SCC) and the Laboratory Data Communication Center (LDCC) Cooling Towers, (03A027 and 03A199, respectively): The SCC and LDCC cooling tower outfalls do not have metals or PCB compliance issues.

  On March 22, 2011 NNSA/LANS representatives requested an NPDES permit change for Outfalls 03A027, 03A113, and 03A199 to allow treated SERF effluent to be discharged through Outfall 03A027. On May 13, 2011 EPA Region 6 issued a minor modification to NPDES Permit No. NM0028355. The minor modification changed permit language to Footnote*1 on Page 18 of Part I of the LANS/NNSA permit. The language in the footnote was changed from "(Effluent from Outfall 13S shall not be discharged at Outfall 03A027 if such effluent contains detectable PCBs.)" to "(Effluent from Outfall 13S shall not be discharged at Outfall 03A027 if

ENCLOSURE 1

such effluent contains detectable PCBs above effluent limitations established for Outfall 13S.)". This language allows for the reuse of treated SERF wastewater in the SCC cooling tower. NNSA/LANS will be required to monitor and report PCB effluent quality from Outfall 03A027 in the monthly discharge monitoring reports (DMRs). Additionally, the Permittees are required to meet interim effluent limits (0.009 ug/l) for total PCBs until the SERF Expansion Project is completed. NNSA/LANS will be required to meet the water quality standard for total PCBs (0.00064 ug/l) when the permit limit becomes effective on August 1, 2012.

Group 2:

- Radioactive Liquid Wastewater Treatment Facility (RLWTF), Outfall 051: The RLWTF has completed numerous changes at the facility to comply with the very stringent zinc and copper limits that went into effect on August 1, 2010. The most recent Notice of Planned Change for RLWTF was submitted on September 28, 2011. The September 28th notice provided information regarding the operational use of perchlorate ion exchange units, design of a seawater reverse osmosis treatment unit to replace the existing waste evaporator, and provided updated information about the installation of zero liquid discharge (ZLD) tanks.

  On March 2, 2010 NNSA/LANS submitted the Final Report on Toxicity Reduction Evaluation (TRE) activities at RLWTF for failed whole effluent toxicity (WET) tests. The Permittees previously submitted the TRE Action Plan and Schedule on January 31, 2008 and provided quarterly status reports to EPA. On March 22, 2011 LANS, NNSA and EPA representatives discussed the facility's WET test results in great detail. LANS representatives discussed corrective actions completed to address metals toxicity, and potential strategies for identifying non-metalic toxicity. On March 28, 2011 NNSA/LANS provided an update on the evaluation of technologies for the removal of toxicity caused by organics in the RLWTF effluent. The March 28th letter outlined a path forward for potential corrective actions, including timelines for completion. A follow up conference call with EPA, LANS and NNSA representatives was conducted on June 15, 2011. Based on EPA guidance, the Permittees will continue working with EPA staff to develop a protocol for "hardness" to be restored to the WET tests performed on operational or compliance aqueous samples from the RLWTF. The "hardness" will be restored to the levels found in the tap water at the Laboratory, which is typically 50 mg/L (expressed as calcium carbonate). Once this protocol is finalized, WET tests on RLWTF aqueous samples will be performed with the "hardness" restored to the 50 mg/L level. WET test results with the "hardness" restored in the sample will be compared to WET test results in samples that did not have the "hardness" restored. If the restoration of "hardness" in the WET test samples is shown to reduce the toxicity, then a protocol

ENCLOSURE 1

will be developed to restore "hardness" in the RLWTF effluent water. Using this protocol "hardness" will be restored to the RLWTF effluent on RLWTF operational and compliance effluent samples, having the "hardness" restored, will then be evaluated. EPA approved these corrective actions on June 21, 2011.

TA-55 Cooling Towers, Outfall 03A181: Design work to tie in the cooling tower effluent to the SWWS or SERF cross country line is underway.

- TA-35 National High Magnetic Field Laboratory (NHMFL) Cooling Tower, Outfall 03A160: An ion exchange system has been installed and the system is treating water. Effluent water samples have been taken and analysis indicates the effluent is well below permitted discharge limits. The metals interim measure is considered complete. NHMFL is currently evaluating a strategy to eliminate the blow-down discharge to the environment, by connecting the cooling tower to the SWWS facility.

Group 3:

- TA-53 LANSCE Cooling Tower, Outfall 03A048: An alternatives analysis for a final remedy solution to eliminate discharges at LANSCE was completed on July 23, 2011. The objective of the Technical Area (TA)-53 Zero Liquid Discharge (ZLD) Project Engineering Study was to evaluate options for cooling tower water treatment to achieve greater water conservation and to achieve ZLD. Currently, the limiting factor to cooling tower water conservation at LANL is the high silica concentration in source water that becomes insoluble and plates out on heat transfer surfaces, and causes fouling of equipment.

  Four ZLD treatment strategies were evaluated. These options included: chemical precipitation, filtration, and reverse osmosis conditioning of cooling tower blow-down water followed by blending the treated water with well water; chemical cooling tower blow-down water followed by blending the conditioning of well water prior to the cooling tower; and, two options using different types of filtration and softening employed on the well water prior to reverse osmosis conditioning. Each option evaluated during this study considered the reuse of water currently being discharged to outfalls, and treatment of the water to remove silica so that the cooling towers can operate more efficiently.

  The preferred alternative for a TA-53 Water Treatment Facility or LANSCE Cooling Water Treatment Facility (LCWTF) combines nano-filtration (membrane softening) with reverse osmosis to remove hardness, silica, and excess total dissolved solids and minimize the required flow capacity of the LCWTF by reducing the blow-down volumes from the cooling towers as a result of improved makeup water quality. This alternative uses fewer chemicals and produces less solid waste than the options using

ENCLOSURE 1

chemical precipitation. Additionally, the preferred alternative was the most cost-effective solution based on capital cost of process equipment and operation and maintenance costs. However, the cost is significant at greater than $20M to construct and yearly operation and maintenance costs of approximately $800K. At this time, there is no funding available to proceed.

Group 4:

- Chemistry and Metallurgy Research (CMR) Air Washers, Outfall 03A021: The final remedy for the CMR is complete. EPA officially deleted NPDES Outfall 03A021 from the NNSA/LANS permit on October 11, 2011.

- Sigma/Beryllium Test Facility Cooling Towers, Outfall 03A022: All construction activities are complete and the system is treating water. The metals interim measure is considered complete. Additionally, the Sigma facility has finalized a design to reroute the cooling tower blow-down to SWWS. Waiting for LANS management approval prior to making final physical modifications. Estimated completion date is the end of the calendar year to alleviate freeze concerns from the temporary modification. In the out years, the Sigma facility will initiate a feasibility study for the replacement and/or modification of existing cooling tower to increase efficiency.

  A compliance sample was collected at NPDES Outfall 03A022 at 10:33a.m. on July 14, 2011. The validated total copper result (received from the analytical laboratory on July 27, 2011) from the monthly outfall compliance sampling event was 0.138 mg/L. This result exceeded the daily maximum permit limit of 0.028 mg/L. The discharge was temporarily rerouted from the interim ion exchange treatment unit directly to the outfall on July 25, 2011. The permanent solution is to route the blow down from the Sigma cooling tower to the SWWS as designed in the Outfall Reduction Program. Additionally, the float on the interior basement sump has been re-set to prevent overflow into the outfall pipe when the building cooling system calls for make-up water.

Group 5:

- TA-15 Dual-Axis Radiographic Hydrodynamic Test (DARHT) Cooling Tower/Septic Effluent, Outfall 03A185: The DARHT cooling tower and facility septic system were connected to the TA-46 SWWS collection system. EPA officially deleted NPDES Outfall 03A185 from the NNSA/LANS permit on October 11, 2011.

ENCLOSURE 1

Other Activities:

- TA-11 Cooling Tower, Outfall 03A130: The project was completed on April 30, 2010. EPA officially deleted NPDES Outfall 03A130 from the NNSA/LANS permit on October 11, 2011.

- PCB Mitigation Update: The permittees have an ongoing program to remove and replace old equipment containing PCBs. There is still some equipment present that may contain oil with low levels of PCBS at non-regulated concentrations. As a mitigating action to reduce the potential for oil from old equipment being discharged to the sanitary collection system from building floor drains, LANS purchased and distributed Petro Plug devices to selected facilities. These cylindrical devices, when placed into a floor drain selectively absorb oil while allowing water to pass through the drain. In addition, Laboratory personnel conducted a walk-through inspection of selected buildings at TA-53 to identify locations where oil leaks could accidently be discharged to the sanitary collection system. Selected building drains were identified for possible PCB swipe sampling.

- Program Budgets Authorized, to date: Outfall Reduction at the Laboratory has authorized up to $15.2M for the projects identified above, not including the SERF Expansion Project (SERF-E). SERF-E has been authorized at $1.1M in preparatory funding to date and new Line Item budget authorization has been authorized for Fiscal Year (FY) 11 funding at $15M.

- Outfall Reduction Program: The Permittees have continued to work on eliminating outfalls and reducing effluent discharges to the environment. NNSA/LANS requested the elimination of NPDES Outfalls 02A129, 03A021, 03A130, and 03A185 from the NPDES permit. Formal notification was submitted to EPA. These outfalls were officially deleted from the NNSA/LANS permit on October 11, 2011. Based on proposed SERF Expansion project, the NNSA/LANS will significantly reduce flows at Outfalls 001, 03A022, 03A027, and 03A160 by recycling treated effluent. Outfalls 05A055, 13S, and 051 have the potential to become no-flow outfalls but will remain in the NPDES permit.

- NPDES Re-Application: Section 402 of the federal Clean Water Act, requires the Permittees to obtain a new NPDES Outfall Permit every five years. The current NPDES permit issued to NNSA/LANS became effective August 1, 2007 and will expire July 31, 2012. The Permittees are required to submit a new application 180 days prior to expiration of the existing permit. NNSA/LANS estimate that the NPDES Re-Application will be submitted to EPA in January 2012. In June 2011, ENV-RCRA personnel conducted NPDES Re-Application kick off meeting with

ENCLOSURE 1

outfall owners and facility representatives. Actions completed to date include: NPDES records and process reviews, review of operation and historical compliance sample results, kick off meetings with NPDES facility owners, and site tours. The Permittees plan to meet with EPA and NMED to review the draft application document in November 2011.

- Zero Liquid Discharge (ZLD) Tanks Project: As previously discussed, Permittees have completed numerous changes at the RLWTF to comply with the very stringent zinc and copper limits. The RLWTF is planning to construct new concrete evaporation tanks at Technical Area 52 to receive fully treated radioactive liquid effluent from RLWTF. These tanks are being constructed to reduce the volume of treated effluent being discharged through NPDES Outfall 051. The construction will also allow for passive evaporation of treated RLWTF effluent. NNSA/LANS submitted a Notice of Planned Change to EPA in May 2007 regarding the construction of the ZLD Tanks. Estimated schedule dates for the ZLD Tanks Subproject are provided below:

  - July 2011: 60% Design
  - August 11, 2011: 90% Design
  - August 15, 2011: Start Construction
  - January 25, 2012: Complete Construction
  - January 26, 2012: Begin Start-up & Testing
  - February 16, 2012: Pre-final Inspection
  - March 1, 2012: Final Inspection

Los Alamos
NATIONAL LABORATORY
EST.1943

Environmental Protection Division
Water Quality & RCRA Group (ENV-RCRA)
P.O. Box 1663, M704
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: September 28, 2011
Refer To: ENV-RCRA-11-0204
LAUR: 11-11554

Ms. Hannah Branning
U.S. Environmental Protection Agency, Region 6
Water Quality Protection Division
Planning and Analysis Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Branning:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051

National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) at Los Alamos National Laboratory (the Laboratory) requires the permittees to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged (see Part III.D.1.a. *Reporting Requirements*).

The purpose of this letter is to notify the EPA of two process changes at the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF). The changes include the use of perchlorate ion exchange and the use of seawater reverse osmosis. In addition, this letter provides updated information about the installation of zero liquid discharge (ZLD) tanks. This notification is being provided even though neither of these process changes will change the nature of or increase the quantity of pollutants discharged at NPDES Outfall 051.

Perchlorate Ion Exchange

In 2002, the RLWTF installed the capability to remove perchlorate via ion exchange. The capability was installed in anticipation of EPA regulations that would limit perchlorate in discharges. To date, the NPDES permit for Outfall 051 has not established a discharge limit for perchlorate, nor has the EPA enacted regulations concerning perchlorate. The Laboratory's NPDES permit does require

annual monitoring for perchlorate. Currently, treated water is being discharged to the environment via evaporation or through Outfall 051.

NNSA/LANS will be modifying its treatment process to bypass the perchlorate ion exchange treatment process whenever treated water will be evaporated. Treatment will include ion exchange for perchlorate removal, when water is to be discharged through Outfall 051.

Sea Water Reverse Osmosis

The RLWTF generates secondary waste streams that cannot be processed with existing treatment equipment. These secondary wastes are currently being concentrated in a mechanical waste evaporator at the RLWTF, then shipped for offsite treatment and disposal as low-level radioactive solid waste. NNSA/LANS is currently designing a seawater reverse osmosis (SWRO) treatment unit to replace the existing waste evaporator. Replacement would occur during calendar year 2012.

As with the waste evaporator, SWRO treatment will split the secondary waste into two streams. Concentrate from the SWRO unit will be the equivalent of evaporator bottoms, and will be shipped for offsite treatment and disposal as low-level radioactive solid waste. The second output stream, permeate from the SWRO unit, will be the equivalent of evaporator overheads. This stream will be re-treated through the low-level treatment plant.

ZLD Tanks

NNSA/LANS are currently designing concrete tanks, to be located at TA52, for solar evaporation of water treated at the RLWTF. As shown in the enclosed process schematic (Enclosure 1), these tanks would provide another path for the discharge of treated water to the environment, so that treated waters can be discharged either through Outfall 051, by mechanical evaporation, or by solar evaporation in two locations.

The Zero-Liquid-Discharge (ZLD) Project consists of two portions: two concrete evaporation tanks, and a length of buried transfer piping that will connect the RLWTF to the ZLD tanks. Project completion is scheduled for 2012.

The tank portion of the ZLD Project will be located on a site of approximately one acre, located about two-thirds of a mile from the RLWTF within Technical Area 52 of the Laboratory. The site is located along the north side of Puye Road, bounded on the south by the road, and on the north by a steep drop-off in grade. The ZLD tanks will be constructed with concrete walls approximately four feet high, and will have a double liner with leak detection. Project design provides the capability of returning the contents of the tanks to the RLWTF for storage and retreatment, if necessary. Transfer piping, made of high-density polyethylene (HDPE), will be routed west from the proposed tanks, along Puye road toward the RLWTF. The length of transfer pipe will be approximately 3500 feet.

Enclosure 1 provides a revised schematic for the treatment of wastewater received at RLWTF for your review. The schematic includes the above-described changes to the treatment process.

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality and RCRA Group (ENV-RCRA) if you have questions.

Sincerely,

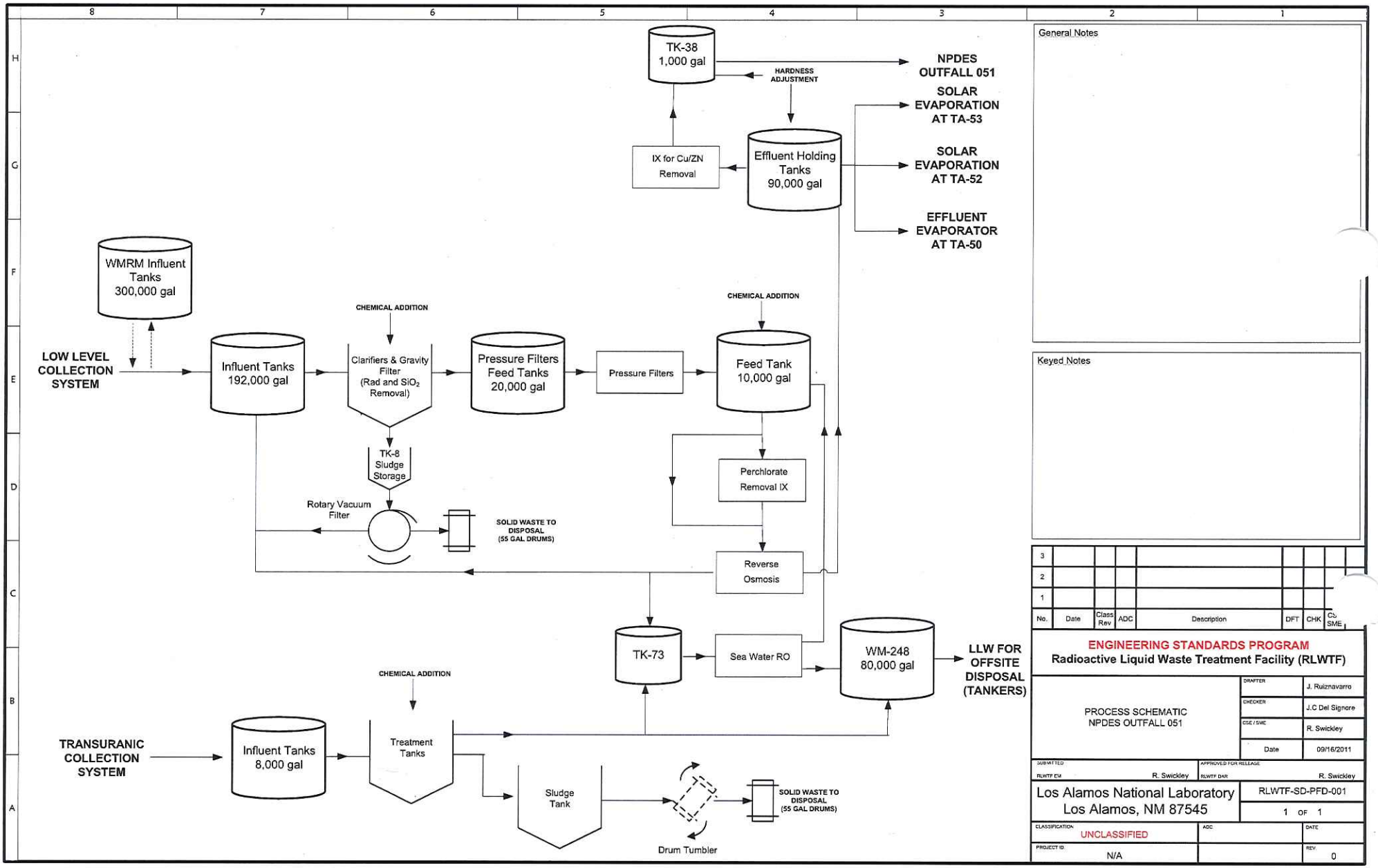
Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group (ENV-RCRA)
Los Alamos National Security, LLC

Sincerely,

Gene Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

ARG:GET:MS/lm

Cy: Isaac Chen, USEPA/Region 6, Dallas, TX, w/enc.
James Bearzi, NMED/SWQB, Santa Fe, NM, w/enc.
Jerry Schoeppner, NMED/GWQB, Santa Fe, NM, w/enc.
Jim Davis, NMED/RPD, Santa Fe, NM, w/enc.
George Rael, LASO-EO, w/enc., A316
Steve Yanicak, LASO-GOV, w/enc., M894
Carl A. Beard, PADOPS, w/o enc., AI02
J. Chris Cantwell, ADESHQ, w/o enc., K491
Mike Saladen, ENV-RCRA, w/o enc., K490, (E-File)
Marc Bailey, ENV-RCRA, w/enc., K490, (E-File)
Bob Beers, ENV-RCRA, w/enc., K490, (E-File)
ENV-RCRA File, w/enc., M704
IRM-RMMSO, w/enc., Al50



General Notes

Keyed Notes

No.	Date	Class Rev	ADC	Description	DFT	CHK	CS/SME
3							
2							
1							

ENGINEERING STANDARDS PROGRAM

Radioactive Liquid Waste Treatment Facility (RLWTF)

PROCESS SCHEMATIC
NPDES OUTFALL 051

DRAFTER	J. Ruiznavarro
CHECKER	J.C Del Signore
CSE / SME	R. Swickley
Date	09/16/2011

SUBMITTED
RLWTF EM: R. Swickley

APPROVED FOR RELEASE
RLWTF DAR: R. Swickley

Los Alamos National Laboratory
Los Alamos, NM 87545

RLWTF-SD-PFD-001

1 OF 1

CLASSIFICATION: UNCLASSIFIED

ADC

DATE

PROJECT ID: N/A

REV: 0

Environmental Protection Division
Water Quality & RCRA Group (ENV-RCRA)
P.O. Box 1663, K490
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: July 25, 2011
Refer To: ENV-RCRA-11-0138
LAUR: 11-04260

1 - Permit/CD
2 - AO & AO matl
3 - DMR's
4 - Vio. Sum. Log
5 - NCR
6 - Correspondence
7 - CRAS
Date Filed
Clerk's Inits.

Ms. Hannah Branning
U.S. Environmental Protection Agency, Region 6
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Received
AUG 01 2011
6EN-W

Dear Ms. Branning:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NO. NM0028355, QUARTERLY PROGRESS REPORT (APRIL 1, 2011 – JUNE 30, 2011)

The NPDES Permit No. NM0028355 issued to the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) for the Los Alamos National Laboratory requires the permittees to submit quarterly progress reports to the U. S. Environmental Protection Agency (EPA) regarding the status of attainment of the state water quality standards–based effluent limits. This letter and Enclosure 1 serves as the sixteenth Quarterly Progress Report for the performance period April 1, 2011 – June 30, 2011. The information in Enclosure 1 was provided by the responsible managers for each activity.

Please contact Mike Saladen, LANS at (505) 665-6085 or Gene Turner, NNSA at (505) 667-5794 if you need additional information concerning the status of the Laboratory's corrective action activities.

Sincerely,

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group
Los Alamos National Laboratory

Sincerely,

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

X9X971

ARG:GT:MS/lm

Enclosure: a/s

Cy: Richard Powell, NMED/SWQB, Santa Fe, NM, w/enc.
George Rael, LASO-EO, w/enc., A906
Gene Turner, LASO-EO, w/enc., A316
Juan Griego, LASO-NSM, w/enc., A316
Isaac Valdez, LASO-NSM, w/enc., A316
Carl A. Beard, PADOPS, w/o enc., A102
J. Chris Cantwell, ADESHQ, w/o enc., K491
Ken Schlindwein, IP-DO, w/enc., M895
Craig Leasure, PADWP, w/enc., A107
Craig Bachmeier, IPM-4, w/enc., J520
Jeffrey Schroeder, SP-PGIU, w/enc., J590
Mike Saladen, ENV-RCRA, K490, w/enc., (E-File)
Marc Bailey, ENV-RCRA, K490, w/enc., (E-File)
Albert Dye, ENV-RCRA, K490, w/enc., (E-File)
Robert Wingo, C-CDE, w/enc., J964
Cindy Blackwell, LC-LESH, w/enc., A187
ENV-RCRA File, w/enc., K490
IRM-RMMSO, w/enc., A150

ENCLOSURE 1

The Permittees have divided facilities into five stand alone projects (groups). A summary of each group is provided below:

Group 1:

- Sanitary Reclamation Recycling Facility (SERF)/TA-46 Sanitary Wastewater System (SWWS), Outfall 13S: LANS received capital money in mid-February 2011. The Request for Proposal (RFP) for a Design Build contract went out February 23, 2011. The pre-bid meeting was held on March 8, 2011 and bids were due mid-April. LANS received approval to order long lead equipment on June 13, 2011. The SERF site survey was completed on June 15th and the "Full Notice To Proceed" was issued on July 11, 2011. The Building Foundation and Structural Steel Design Package was 60% complete on July 13, 2011. On July 14, 2011, the Main Process 60% Design Package was 17% complete and the Mass Excavation 60% Design Package was 20% complete. SERF water supply to the Strategic Computing Complex (SCC) cooling tower is expected to be operational by the end of August 2011. Currently, LANS is projecting treated SERF wastewater to the SCC cooling tower starting on August 22nd for a 24 hour/day run, for an estimated period of 36-72 hours. Prior to August 22nd, LANS may conduct one or more operational runs of a half hour or less to check out valves, pressures, etc. LANS is preparing contingency plans if the SERF project is delayed and working with vendors to determine which products could meet the PCB requirements.

  On June 1, 2010, NNSA/LANS notified EPA staff of a pilot study conducted at the SWWS Plant. The pilot study was intended to investigate systematic increases in Biological Oxygen Demand (BOD) up to specifications for plant design, via the addition of crude glycerol (glycerine). The SWWS has been operating with BOD typically lower than its design criteria. The pilot study evaluated if the increase of BOD at the SWWS resulted in a more robust microorganism population and therein improved plant operations. Investigators added glycerine into the northwest Aeration Basin (NW AB), and after equilibration and dissolution, the BOD enhanced wastewater was then transferred from the NW AB back to the Equalization Basins for processing using current operations. There was never a direct discharge from the pilot study to Outfall 13S. Operating parameters were closely monitored via on-site measurement and off-site sample analysis. Results from the study demonstrated that the wastewater treatment plant had more diverse microorganisms and healthier populations with the addition of glycerine. Therefore, NNSA/LANS formally notified EPA of the permanent feeding of glycerin at the head works into SWWS on June 14, 2011. SWWS operators are continuing to conduct operational monitoring to evaluate treatment plant performance.

ENCLOSURE 1

- TA-3 Power Plant, Outfall 001: The boiler blow-down was re-plumbed to the TA-46 SWWS Plant. The Power Plant will limit generation to ensure discharges meet temperature limits. Modifications necessary to cool water below discharge limits are in place. A sump in the Power Plant basement has been cleaned a couple of times. There are plans to drain it, clean it again, and apply an epoxy or other impervious liner by the end of 2011.

- Strategic Computing Complex (SCC) and the Laboratory Data Communication Center (LDCC) Cooling Towers, (03A027 and 03A199, respectively): The SCC and LDCC cooling tower outfalls do not have a metals or PCB compliance issues.

  On March 22, 2011 LANS representatives requested an NPDES permit change for Outfalls 03A027, 03A113, and 03A199 to allow treated SERF effluent to be discharged through Outfall 03A027. On May 13, 2011 EPA Region 6 issued a minor modification to NPDES Permit No. NM0028355. The minor modification changed permit language to Footnote*1 on Page 18 of Part I of the LANS/NNSA permit. The language in the footnote was changed from "(Effluent from Outfall 13S shall not be discharged at Outfall 03A027 if such effluent contains detectable PCBs.)" to "(Effluent from Outfall 13S shall not be discharged at Outfall 03A027 if such effluent contains detectable PCBs above effluent limitations established for Outfall 13S.)". This language allows for the reuse of treated SERF wastewater in the SCC cooling tower. NNSA/LANS will be required to monitor and report PCB effluent quality from Outfall 03A027 in the monthly discharge monitoring reports (DMRs). Additionally, the Permittees are required to meet interim effluent limits (0.009 ug/l) for total PCBs until the SERF Expansion Project is completed. NNSA/LANS will be required to meet the water quality standard for total PCBs (0.00064 ug/l) when the permit limit becomes effective on August 1, 2012.

Group 2:

- Radioactive Liquid Wastewater Treatment Facility (RLWTF), Outfall 051: The RLWTF has completed numerous changes at the facility comply with the very stringent zinc and copper limits that went into effect on August 1, 2010. The most recent Notice of Planned Change for RLWTF was submitted on February 23, 2011. The February 23rd notice indicated that the RLWTF was making modifications to the low-level wastewater treatment system. Modifications included installing pipes and components to bypass the existing RLWTF gravity sand filter and tubular ultra-filter, and replace the bypassed treatment processes with a pressure media filtration and cartridge filtration capacity. The installation of these new filtration capabilities will provide the RLWTF with reliable filtration downstream of the process clarifier and upstream of the reverse osmosis unit. Additionally, the seawater reverse osmosis unit and associated reject tank were removed from the treatment system. Lastly, operators at the RLWTF initiated the use of magnesium hydroxide instead of calcium hydroxide in the facility's treatment system clarifier.

ENCLOSURE 1

On March 2, 2010 NNSA/LANS submitted the Final Report on Toxicity Reduction Evaluation (TRE) activities at RLWTF for failed whole effluent toxicity (WET) tests. The Permittees previously submitted the TRE Action Plan and Schedule on January 31, 2008 and provided quarterly status reports to EPA. On March 22, 2011 LANS, NNSA and EPA representatives discussed the facility's WET test results in great detail. LANS representatives discussed corrective actions completed to address metals toxicity, and potential strategies for identifying non-metalic toxicity. On March 28, 2011 NNSA/LANS provided an update on the evaluation of technologies for the removal of toxicity caused by organics in the RLWTF effluent. The March 28th letter outlined a path forward for potential corrective actions, including timelines for completion. A follow up conference call with EPA, LANS and NNSA representatives was conducted on June 15, 2011. Based on EPA guidance, the Permittees will continue working with EPA staff to develop a protocol for "hardness" to be restored to the WET tests performed on operational or compliance aqueous samples from the RLWTF. The "hardness" will be restored to the levels found in the tap water at the Laboratory, which is typically 50 mg/L (expressed as calcium carbonate). Once this protocol is finalized, WET tests on RLWTF aqueous samples will be performed with the "hardness" restored to the 50 mg/L level. WET test results with the "hardness" restored in the sample will be compared to WET test results in samples that did not have the "hardness" restored. If the restoration of "hardness" in the WET test samples is shown to reduce the toxicity, then a protocol will be developed to restore "hardness" in the RLWTF effluent water. Using this protocol "hardness" will be restored to the RLWTF effluent water. WET test results on RLWTF operational and compliance effluent samples, having the "hardness" restored, will then be evaluated. EPA approved these corrective actions on June 21, 2011.

- TA-55 Cooling Towers, Outfall 03A181: Design work to tie in the cooling tower effluent to the SWWS or SERF cross country line is underway.

- TA-35 National High Magnetic Field Laboratory (NHMFL) Cooling Tower, Outfall 03A160: An ion exchange system has been installed and the system is treating water. Effluent water samples have been taken and analysis indicates the effluent is well below permitted discharge limits. The metals interim measure is considered complete.

ENCLOSURE 1

Group 3:

- TA-53 LANSCE Cooling Tower, Outfall 03A048: The Permittees collected an NPDES compliance sample at Outfall 03A048 on December 7, 2010. The arsenic sample was sent to an outside laboratory for analysis and results were received on January 3, 2011. This result was above the monthly average permit limit of 10 ug/l, but less than the daily maximum permit limit of 14.0 ug/l. Corrective actions have been completed and the effluent has been below permit limits since January 2011. An alternatives analysis for a final remedy solution to eliminate discharges at LANSCE is complete.

Group 4:

- Chemistry and Metallurgy Research (CMR) Air Washers, Outfall 03A021: The final remedy for the CMR is complete. A permit modification to eliminate this outfall is pending.

- Sigma/Beryllium Test Facility Cooling Towers, Outfall 03A022: All construction activities are complete and the system is treating water. The metals interim measure is considered complete.

  NPDES compliance samples were collected at the TA-3-2274 Cooling Tower (Outfall 03A022) on May 5, 2011. The sample results were received from the analytical laboratory on May 20, 2011. The total copper result was 0.051 mg/L. This result exceeded the daily maximum permit limit of 0.028 mg/L. NNSA/LANS conducted a critique on May 23, 2011 with facility representatives. Operational samples collected the same day by Facility personnel showed < 0.005 mg/L total copper. Additional operational samples were collected from the emergency cooling system and the procedure to manually blow down the system was reviewed. To date, physical verification of drawings and actual connections has not shown any visible cross connects. Facility operators will continue to collect weekly operational samples to ensure the treatment unit is functioning properly. NPDES Outfall 03A022 intermittently discharges into Mortandad Canyon, an ephemeral tributary to the Rio Grande. No adverse impacts were observed. On June 16, 2011 LANS collected compliance samples at Outfall 03A022. The June 16th total copper compliance sample result was 5.57 ug/L (back in compliance).

ENCLOSURE 1

Group 5:

- TA-15 Dual-Axis Radiographic Hydrodynamic Test (DARHT) Cooling Tower/Septic Effluent, Outfall 03A185: The DARHT cooling tower and facility septic system were connected to the TA-46 SWWS collection system. A permit modification to eliminate this outfall is pending.

Other Activities:

- TA-11 Cooling Tower, Outfall 03A130: The project was completed on April 30, 2010. A permit modification to eliminate the outfall is pending.

- PCB Mitigation Update: The permittees have an ongoing program to remove and replace old equipment containing PCBs. There is still some equipment present that may contain oil with low levels of PCBS at non-regulated concentrations. As a mitigating action to reduce the potential for oil from old equipment being discharged to the sanitary collection system from building floor drains, the Laboratory purchased and distributed Petro Plug devices to selected facilities. These cylindrical devices, when placed into a floor, drain selectively absorb oil while allowing water to pass through the drain. In addition, Laboratory personnel conducted a walk-through inspection of selected buildings at TA-53 to identify locations where oil leaks could accidently be discharged to the sanitary collection system. Selected building drains were identified for possible PCB swipe sampling.

- Program Budgets Authorized, to date: Outfall Reduction at the Laboratory has authorized up to $15.2M for the projects identified above exclusive of the SERF Expansion Project (SERF-E). SERF-E has been authorized at $1.1M in preparatory funding to date and new Line Item budget authorization has been authorized for Fiscal Year (FY) 11 funding at $15M. Final remedies in most cases have not yet been estimated.

- Outfall Reduction Program: The Permittees have continued to work on eliminating outfalls and reducing effluent discharges to the environment. NNSA/LANS will be requesting the elimination of NPDES Outfalls 02A129, 03A021, 03A130, and 03A185 from the NPDES permit. Formal notification will be submitted to EPA. EPA representatives have previously indicated they could eliminate these outfalls under a minor modification to the permit. Based on proposed SERF Expansion project, the NNSA/LANS will significantly reduce flows at Outfalls 001, 03A022, 03A027, and 03A160 by recycling treated effluent. Outfalls 05A055, 13S, and 051 have the potential to become no-flow outfalls but will remain in the NPDES permit.

ENCLOSURE 1

- NPDES Re-Application: Section 402 of the federal Clean Water Act, requires the Permittees to obtain a new NPDES Outfall Permit every five years. The current NPDES permit issued to NNSA/LANS became effective August 1, 2007 and will expire July 31, 2012. The Permittees are required to submit a new application 180 days prior to expiration of the existing permit. NNSA/LANS estimate that the NPDES Re-Application will be submitted to EPA in January 2012. In June 2011, ENV-RCRA personnel conducted NPDES Re-Application kick off meeting with outfall owners and facility representatives. Actions completed to date include: NPDES records and process reviews, review of operation and historical compliance sample results, kick off meetings with NPDES facility owners, and site tours. The Permittees plan to meet with EPA and NMED to review the draft application document in October 2011.

- Los Conchas Wildfire: The Los Conchas wildfire began on June 26, 2011 and led to the closure of the Los Alamos National Laboratory and the evacuation of 12,000 Los Alamos County residents. Only one acre burned on Laboratory property, near Technical Area 49. The fire spotted and jumped the New Mexico State Road 4 (NM-4) early on the afternoon of June 27th. The small blaze was quickly extinguished. The Las Conchas Fire surpassed 150,000 acres and is the largest fire in New Mexico history.

  A list of critical Fire Recovery Activities that have been completed and are summarized below:

  - All waste from the four burnt (priority) watershed systems has been removed / relocated and properly managed.
  - Removed media collected for the two surface water retention structures within Los Alamos Canyon.
  - All well heads are protected in Los Alamos Canyon.

  LANS resources have continued to coordinate with the National Parks Service, U. S. Forest Service, Los Alamos County and NNSA. It should be noted that the Las Conchas wildfire is still not fully contained. There may be additional impacts from smoke, ongoing fire, runoff and flood potential, extreme fire conditions and limited facility access, or other unforeseen events, which may continue to delay field work. Mitigative actions to minimize these delays are currently underway as NNSA/LANS continue to exercise due diligence in determining the full extent of the Las Conchas wildfire's impacts.

- EPA Meeting on March 22, 2011: Mike Saladen, Pete Worland, Terrill Lemke, and Sam Loftin, representing LANS and Gene Turner, NNSA, met with Isaac Chen, Diana McDonald, Sonia Hall, Thea Lomax, Phillip Jennings, Brent Larsen, and Hannah Branning of EPA Region VI on March 22, 2011. LANS, NNSA and EPA

ENCLOSURE 1

representatives met to discuss the LANS/NNSA'NPDES) permit programs for NPDES outfalls and individual permit for storm water, Permit Nos. NM0028355 and NM0030759, respectively. During the March 22, 2011 meeting, the Permittees discussed in detail corrective actions completed to bring Laboratory facilities into compliance with more stringent effluent limits for pH, temperature, metals and PCBs. Meeting minutes were submitted to EPA and NMED for review on May 19, 2011.

- Zero Liquid Discharge (ZLD) Tanks Project: As previously discussed, Permittees have completed numerous changes at the RLWTF to comply with the very stringent zinc and copper limits. The RLWTF is planning to construct new concrete evaporation tanks at Technical Area 52 to receive fully treated radioactive liquid effluent from RLWTF. These tanks are being constructed to reduce the volume of treated effluent being discharged through NPDES Outfall 051. The construction will also allow for passive evaporation of treated RLWTF effluent. NNSA/LANS submitted a Notice of Planned Change to EPA in May 2007 regarding the construction of the ZLD Tanks. Estimated schedule dates for the ZLD Tanks Subproject are provided below:

  - July 2011: 60% Design
  - August 11, 2011: 90% Design
  - August 15, 2011: Start Construction
  - January 25, 2012: Complete Construction
  - January 26, 2012: Begin Start-up & Testing
  - February 16, 2012: Pre-final Inspection
  - March 1, 2012: Final Inspection

Los Alamos
NATIONAL LABORATORY
EST.1943

Environmental Protection Division
Water Quality & RCRA (ENV-RCRA)
P.O. Box 1663, Mail Stop K490
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

1 - Permit/CD
2 - AO & AO matl
3 - DMR's
4 - Vio. Sum. Log
5 - NCR
6 - Correspondence ✓
7 - CRAS
Date Filed ✓
Clerk's Inits.

Date: May 19, 2011
Refer To: ENV-RCRA-11-0095
LAUR: 11-10625

Received
MAY 25 2011
6EN-W

Ms. Sonia Hall
USEPA Region 6
Compliance Assurance & Enforcement Division
Water Enforcement Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Ms. Hannah Branning
USEPA Region 6
Compliance Assurance & Enforcement Division
Water Enforcement Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Hall and Ms. Branning:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, EPA MEETING MINUTES, MARCH 22, 2011

Dear Ms. Hall and Ms. Branning:

On March 22, 2011 representatives from the Los Alamos National Security Inc. (LANS) and the National Nuclear Security Administration (NNSA) met with U.S. Environmental Protection Agency (EPA), Region VI staff. The representatives met to discuss the permittees' National Pollutant Discharge Elimination System (NPDES) Permit Programs for NPDES Outfalls and Storm Water, NPDES Permits No. NM0028355 and NM0030759, respectively. Enclosed for your review are the meeting minutes documenting our discussions (See Enclosure 1).

The permittees would like to thank EPA representatives for taking the time to meet with us on March 22, 2011. Please do not hesitate to call me at (505) 665-6085 or Terrill Lemke at (505) 665-2397 if you have questions or need additional information. Thanks for your assistance.

Sincerely,

Mike Saladen
Water Quality & RCRA Group (ENV-RCRA)

06141

Enclosure: a/s

Cy: Diana McDonald, USEPA/Region 6, Dallas, TX, w/enc.
Bret Larson, USEPA/Region 6, Dallas, TX, w/enc.
Isaac Chen, USEPA/Region 6, Dallas, TX, w/enc.
Jim Davis, NMED, Santa Fe, NM, w/enc.
Glenn Saums, NMED/SWQB, Santa Fe, NM, w/enc.
Gene Turner, LASO-EO, w/enc., A316
Carl A. Beard, PADOPS, w/o enc., A102
J. Chris Cantwell, ADESHQ, w/o enc., K491
Mike Saladen, ENV-RCRA, w/enc., K490, (E-File)
Terrill Lemke, ENV-RCRA, w/enc., K490, (E-File)
Sam Loftin, ENV-RCRA, w/enc., K490, (E-File)
Marc Bailey, ENV-RCRA, w/enc., K490, (E-File)
Cindy Blackwell, LC-LESH, w/enc., A187
ENV-RCRA File, w/enc., K490
IRM-RMMSO, w/enc., A150

ENCLOSURE 1

ENCLOSURE 1

ENV-RCRA-11-0095 LAUR-11-10625

NPDES Permit No. NM0028355, EPA Meeting Minutes, March 22, 2011

Summary

Mike Saladen, Pete Worland, Terrill Lemke, and Sam Loftin, representing Los Alamos National Security Inc. (LANS) and Gene Turner from the National Nuclear Security Administration (NNSA) met with Isaac Chen, Diana McDonald, Sonia Hall, Thea Lomax, Phillip Jennings, Brent Larsen, and Hannah Branning of the U.S. Environmental Protection Agency (EPA), Region VI on March 22, 2011. LANS, NNSA and EPA representatives met to discuss the LANS/NNSA's National Pollutant Discharge Elimination System (NPDES) Permit Programs for NPDES Outfalls and Storm Water, NPDES Permit No. NM0028355 and NM0030759, respectively. Summarized below are the meeting minutes from the meeting.

Quarterly Progress Reports: The NPDES permit for the Los Alamos National Laboratory was issued on August 1, 2007. The permit requires the permittees to submit to EPA and the New Mexico Environment Department (NMED) quarterly progress reports regarding the status of attainment of the water quality standards-based effluent limits. To date, the permittees have submitted fourteen progress reports. A copy of the most recent NPDES Quarterly Progress Report was submitted to EPA and NMED on January 19, 2011. During the March 22, 2011 meeting, the permittees discussed in detail corrective actions completed to bring Laboratory facilities into compliance with more stringent effluent limits for pH, temperature, metals and PCBs.

For the purpose of project execution, NNSA/LANS HAVE divided facilities into five stand alone projects (groups). A summary of each group is provided below:

Group 1

- Sanitary Reclamation Recycling Facility (SERF): A Finding of No Significant Impact (FONSI) was made as a result of an Environmental Assessment conducted under National Environmental Policy Act and issued on August 23, 2010. Additionally, NNSA/LANS received the necessary funding for the SERF in mid February, 2011 and the project is currently in the procurement phase. NNSA/LANS are currently preparing contingency plans in the event the SERF project is delayed. Finally, the Biological Oxygen Demand Study will continue until data is collected in all four seasons.

- TA-3 Power Plant (Outfall 001): The boiler blow-down was re-plumbed to the TA-46 Sanitary Wastewater System (SWWS). The Power Plant will not run generation until all modifications necessary to cool water below discharge limits are in place. A sump in the Power Plant basement has been cleaned a couple of times. The LANS Maintenance Department plans to drain it, clean it again, and apply an epoxy or other impervious liner by the end of July, 2011.

- Strategic Computing Complex (SCC) and the Laboratory Data Communication Center (LDCC) Cooling Towers: The SCC and LDCC cooling tower outfalls (03A027 and 03A199 respectively) do not have metals or polychlorinated biphenyl (PCB) compliance issues. However, the permittees explained that permit language on page 18 of Part I, footnote *1 of the NPDES Permit states in part:"Effluent limitations and monitoring requirements only apply at Outfall 03A027 when effluent from outfall 13S is rerouted and discharged at Outfalls 03A027." This language applies to PCB effluent limits and monitoring requirements. The intent is to apply the PCB limit and monitoring requirements to Outfall 03A027 if treated SWWS wastewater goes through the cooling tower outfall and the permittees do not have issues with this language. The purpose of the SERF project is to allow treated water to be re-circulated and reused in cooling towers to reduce potable water consumption. However, the permit goes on to state, in part: "(Effluent from Outfall 13S shall not be discharged at Outfall 03A027 if such effluent contains detectable PCBs)." The language may restrict the permittees from recycling SERF water. Given the detection limit at parts per quadrillion levels, using the PCB congener method of analysis (EPA 1668) will most certainly result in detectable PCBs. Based on this language, NNSA/LANS will not be able to discharge even if the PCB results are below the effluent limit, because they are "detectable". The permittees requested that the last sentence be eliminated from the permit. A written request will be submitted to EPA. On May 13, 2011 LANS/NNSA received a minor modification that addressed the language change to allow effluent from SERF to be discharged through NPDES Outfall 03A027 if it met interim and final NPDES permit limits for PCBs.

Group 2

- Radioactive Liquid Wastewater Treatment Facility (Outfall 051): The treatment media selected has been shown to be successful in reaching discharge limits for copper and zinc. However, the media is not commercially available and has demonstrated a very short operational life. The treated effluent is required by the permit to be retained and sampled prior to discharge. The steel tanks used for effluent storage have been found to leach and re-contaminate the treated effluent. A new polypropylene 1,000 gallon storage tank has been installed and is in operation. Alternatives in treatment as well as operational changes continue to be explored in hopes of developing an affordable and sustainable, compliant, effluent stream. The Radioactive Liquid Wastewater Treatment Facility (RLWTF) discharged twice during the last quarter of 2010. The RLWTF discharged 898 gallons (3400 liters) on November 18, 2010 and another 898 gallons (3400 liters) on November 22, 2010. Both discharges were in compliance with the new copper and zinc limits. The Whole Effluent Toxicity (WET) sample collected on November 18th passed the WET test.

- TA-55 Cooling Towers (Outfall 03A181): Design work to tie in the cooling tower effluent to the SWWS or SERF cross country line is underway.

- TA-35 National High Magnetic Field laboratory (NHMFL) Cooling Towers (Outfall 03A160): An ion exchange system has been installed and the system is treating water. Effluent water samples have been taken and analysis indicates the effluent is well below permitted discharge limits for all metal analytes; therefore the metals interim measure is considered complete.

Group 3

- TA-53 Los Alamos Neutron Science Center (LANSCE) Cooling Tower (Outfall 03A048): The Laboratory collected an NPDES compliance sample at Outfall 03A048 on December 7, 2010. The sample was sent to an outside laboratory for analysis and results were received on January 3, 2011. Data was verified with no problems noted. This result was above the monthly average permit limit of 10 ug/l, but less than the daily maximum permit limit of 14.0 ug/l. Corrective actions were completed. An alternatives analysis for a final remedy solution to eliminate discharges at LANSCE is complete.

Group 4

- Chemistry and Metallurgy Research (CMR) Air Washers (Outfall 03A021): The final remedy for the CMR is complete. Permit modification to eliminate this outfall is pending.

- Sigma/Beryllium Test Facility Cooling Tower (Outfall 03A022): All construction activities are complete and the system is treating water. The metals interim measure is considered complete.

Group 5

- TA-15 Dual-Axis Radiographic Hydrodynamic Test (DARHT) Cooling Tower/Septic effluent (Outfall 03A185): The DARHT cooling tower and facility septic system was connected to the TA-46 SWWS collection system. Permit modification to eliminate this outfall is pending.

Other Activities

- TA-11 Cooling Tower Outfall (Outfall 03A130): Retention of cooling tower blow-down in tank was completed on April 30, 2010. Permit modification to eliminate the outfall is pending.

- PCB Mitigation Update: The permittees have an ongoing program to remove and replace old equipment containing PCBs. There is still some equipment present that may contain

oil with low levels of PCBs at non-regulated concentrations. As a mitigating action to reduce the potential for oil from old equipment being discharged to the sanitary collection system from building floor drains, the permittees have purchased and distributed Petro Plug devices to selected facilities. These cylindrical devices, when placed into a floor drain, selectively absorb oil while allowing water to pass through the drain. In addition, NNSA/LANS personnel conducted a walk-through inspection of selected buildings at TA-53 to identify locations where oil leaks could accidently be discharged to the sanitary collection system. Selected building drains were identified for possible PCB swipe sampling.

TA-50 RLWTF: The RLWTF has completed numerous changes at the facility to bring the facility into compliance with the very stringent zinc and copper limits by August 1, 2011. During the meeting, the permittees discussed the process changes in detail, and followed up with discussions on the Notices of Planned Change regarding actions taken by the facility. Approval was received to bypass the gravity filter and the TUF and install the pressure media filters (Notice of Change submitted to EPA 2/23/2011), and for the use of magnesium hydroxide instead of calcium hydroxide in the clarifier (Notice of Change submitted to EPA 2/23/2011).

On March 2, 2010 NNSA/LANS submitted the Final Report on Toxicity Reduction Evaluation (TRE) activities at RLWTF for failed whole effluent toxicity (WET) tests. LANS/NNSA previously submitted the TRE Action Plan and Schedule on January 31, 2008 and provided quarterly status reports to EPA. Mr. Worland and Mr. Jennings discussed the facility's WET test results in great detail. The permittees discussed corrective actions completed to address metal toxicity, and potential strategies for identifying non-metalic toxicity. One strategy was to restore hardness back into effluent prior to discharge. EPA representatives indicated that there was some risk of impure hardness constituents being added. Impure hardness may take care of the WET toxicity but add metals back into the system and suggested adding hardness to the WET test at the level of influent water. This guidance is outlined in an EPA document entitled "Technical Support Document for Water Quality-based Toxics Control", dated March, 1991. Mr. Jennings indicated additional measures need to be provided to EPA to get their approval for Pacific EcoRisk Laboratory to restore hardness to the WET tests and in adding hardness to the effluent.

Carbon Filter Units in Water Canyon – Aluminum issue: The permittees submitted an NPDES application for new discharges to surface water under the NPDES program on September 3, 2009. The application covered discharges from carbon treatment units located in Canon de Valle (2 locations) and Martin Spring Canyon for the cleanup of high explosives (HE) in spring water. These treatment units are part of the corrective measures identified in the Corrective Measure Study (CMS) report approved by the New Mexico Environment Department Hazardous Waste Bureau for remediating HE and other contaminants subject to the Compliance

Order on Consent (Consent Order). The treatment of groundwater is only temporary if treatment successfully removes contamination to meet conditions of the Consent Order. Naturally occurring aluminum in the groundwater is above the state surface water quality standard. Mr. Chen indicated he would be required to incorporate an aluminum effluent limit in the NPDES permit because data provided by NNSA/LANS demonstrated that there is a reasonable potential for exceedance of the state water quality standard. Mr. Chen also indicated that the permittees would have to conduct a Use Attainability Analysis (UAA) to petition the EPA and the New Mexico Water Quality Control Commission (NMWQCC) to develop a site specific standard for aluminum. Additionally, the new proposed language in the NMWQCC water quality standards regarding background is currently being reviewed by EPA. It was the understanding by EPA that this "background" language would not be approved by EPA. EPA will put the permit issuance on-hold until LANS/NNSA requests them to move forward on the permit.

NNSA/LANS Response to EPA's NOV (February 2011): The permittees received a Notice of Violation (NOV) from EPA Region 6 on December 7, 2010. The NOV was for Total Residual Chlorine (TRC) exceedances at Outfall 03A048 on June 17, 2010 and September 27, 2010. NNSA/LANS provided a 24 hour verbal notification for each exceedance and submitted the required five day written report to EPA which included remedial actions. This information was also included on the respective Discharge Monitoring Reports (DMRs). A formal written response to the NOV was submitted on February 9, 2011. EPA indicated no additional information was needed.

Outfall Reduction Program: The focus has continued on eliminating outfalls and reducing effluent discharges to the environment. The permittees will be requesting the elimination of NPDES Outfalls 02A129, 03A021, 03A130, and 03A185 from the NPDES Permit and are waiting on NMED to inspect the sites on behalf of EPA. At that time, formal notification will be submitted. Mr. Chen indicated these outfalls could be eliminated under a minor modification to the permit. Based on proposed SERF expansion project, the permittees will significantly reduce flows at Outfalls 001, 03A022, 03A027, and 03A160 by recycling of treated effluent. Outfalls 05A055, 13S, and 051have the potential to become no flow outfalls but will remain in the permit.

NPDES Re-Application: The NNSA/LANS outfall permit will expire in July 31, 2012. The permittees will be required to submit a permit re-application in January 2012 and will be initiating the NPDES Re-Application Project in the next couple of months. Based on past history, NNSA/LANS will need to meet with Isaac Chen to discuss permit strategies in May 2011.

NPDES Permit No. NM0028355, EPA Meeting Minutes, March 22, 2011

Storm Water Program, Individual Permit (IP):

Red text indicates permittee's understanding of the answers provided by EPA during the meeting.

1. Overview of LANL IP program

See slides and information provided at time of meeting.

2. Permit Language Clarifications

1. The Permittees identify "soil disturbance" as listed in Sections D.4.(a), E.5.(a), and I.1 to be that as defined in the NPDES Construction General Permit.

Acceptable

- Part II, Section B., 24-Hour Oral Reporting, states "Exceedances of maximum target levels (MTLs) for any applicable pollutants shall be reported orally to EPA Region 6…".
- The Permittees identify this requirement to be exceedances of MTALs.

Yes, this section is referencing MTALs.

- Part III, D.7, Twenty-Four Hour Reporting, identifies reporting any noncompliance which may endanger health or the environment within 24 hours of the event, and requires a follow-on written notification within 5 days.

- A 24-hour notification is also identified Part II, Section B. However, it is the Permittees interpretation that the Part III notification is distinct from the Part II notification, and that a 5-day report is not required for the Part II 24-hour notification since an MTAL exceedance is not a Permit noncompliance which endangers health or the environment, as specified in Part III.

A 5-day report is not required for an MTAL exceedance. It was also recommended by EPA personnel that when making the required 24-hour notification that the notifications be made orally using the notification phone number and not the optional email.

- Given the Permit timeframes for required completion of corrective actions, the Permittees may implement additional control measures at a site that augment the initial certified Baseline Control Measures, prior to the collection of the two baseline confirmation samples required by Section I.D.1.

- Based on the requirements in Section B.1 for initial certification of Baseline Control Measures, additional certification of these augmented baseline control measures will not be performed.

Additional certification is not required.

- In order to designate a Site as "No Exposure", the Permittees would like to use the MSGP criteria identified on the MSGP "No Exposure Certification" form.

Use of the MSGP "No Exposure" criteria and certification form as the basis for establishing criteria and documentation of "No Exposure" for IP sites was acceptable. Since most of the potential "no exposure" sites would most likely be former outfalls, it was also recommended by EPA personnel that some additional criteria specific to outfalls be created.

3. Clarification of Monitoring Requirements

1. Section D.3 states that, "Samples shall not be used if the collected volume of sample is insufficient to perform all required analyses".

    - If confirmation samples are missing results for some pollutants due to preservation error, bottle breakage during shipment, or analytical laboratory error, the Permittees would like to be able to recollect only the sufficient volume needed to replace the missing analytical results.

If any confirmation samples are missing results the full volume must be recollected. Sample results can't be mixed as parts of two different samples (storm events) can't be used to be a representative sample for a site.

2. Section D.2 identifies that Permittees may move a sampler, without Permit modification, to make minor adjustments to ensure that the sample location is representative.

    - The Permittees have identified the following criteria for minor adjustments:
        - Moving a sampler in response to updated information on Site boundaries (same receiving water).
        - Moving a sampler in response to changes in storm water drainage patterns brought about by implementation of Baseline Control Measures, Corrective Actions, or construction/remediation activities.
        - The Permittees have identified that the following criteria would require Permit modification.

- Moving a sampler to a new location such that storm water discharges to a different receiving water.
- Addition of a new Site or corresponding SMA to the Permit.

The permittees sought clarification regarding "minor adjustments" that will not require the permit to be modified under Section D.2. EPA personnel (Diana McDonald) agreed to contact EPA counsel to seek clarification.

4. Permit Modification Logistics

1. How should the Permittees request a minor Permit modification to correct typographical errors?

    - For example, Site No. 46-004(e2) was inadvertently assigned to CDB-SMA-0.55 in Appendix A due to typographical error. 46-004(e2) should be assigned to CDB-SMA-0.25.

Requests for such minor permit modifications should be sent in writing to Isaac Chen. Such requests should also include the permit required email notification to the public.

2. Section D.2 of the Permit identifies that a major Permit modification is required for non-minor SMA relocation, and that a technical justification is to be submitted to EPA.

It was noted in discussion that the reference above to an SMA relocation being a major modification may be an error as EPA personnel thought this to be a minor modification. 40 CFR 122 or 125 was provided as a reference for definition of the type of permit modifications.

What kind of information and level of detail is required for justification?

Technical justification, in writing, and a new site map providing detail on the request.

What is the process for major Permit modification?

Major modification would be just like opening a new permit.

To facilitate planning purposes, what is the timeframe for a major Permit modification?

Permittees should allow 30 days for minor permit modification requests sent to Isaac Chen. Given the nature of major modifications (like a new permit) timeframes for these modifications cannot be accurately estimated. Major modifications are unlikely, however.

Can we perform initial monitoring at the new location pending Permit modification?

It was agreed upon that monitoring at the new location could be initiated pending permit modification. However, it was recommended that sampling capabilities at the old locations be maintained until approval of the new locations was granted, just in case the request was disapproved.

5. Communication & Correspondence

1. Could EPA please provide points of contact for technical questions and issues associated with the following areas:
    - Submission of required deliverables

Sonia Hall. Hard copy of deliverables sent to Sonia and an electronic copy sent to Isaac Chen.

    - Permit modifications

Isaac Chen. For anything sent to Isaac, Sonia Hall is to receive an electronic copy.

    - Storm water monitoring issues (sample collection, analytes and test methods, etc.)

Diana McDonald and Jana Harvill

    - Site-specific MQLs

Isaac Chen. For general permit questions and clarifications, Isaac Chen or Diana McDonald, depending on the item should be contacted.

2. With regard to the submission and transfer of Permit deliverables:

    - Is the use of an electronic signature acceptable, and if so are there any restrictions or specific requirements?

Electronic signatures are acceptable on DMRs only. There is no software or other specific requirements.

Is the use of an FTP site for delivery of documents acceptable or feasible?

No. Deliverables need to be provided in CD or hard copy format due to EPA record keeping needs and to facilitate potential FOIA requests.

How are certification signatures that are scanned as part of a document and sent electronically protected?

Such signatures are kept with EPA's records. No additional security measures.

NM 28355

NM 28355

FW: E-File

Michael T. Saladen to: Isaac Chen, Hannah Branning, Sonia Hall 05/23/2011 03:06 PM
Cc: saladen_michael_t, "'Marc Bailey'", "'Terrill Lemke'"

All,

Attached are the meeting minutes I drafted from our March 22nd meeting. Please let me know if you have questions or edits. Please pass along to others, if needed. Thanks!!!

Mike

From: Medina, Louella B [mailto:lbmedina@lanl.gov]
Sent: Friday, May 20, 2011 12:58 PM
To: Saladen, Michael T; Bailey, Marc A; Lemke, Terrill W; Loftin, Samuel R
Subject: E-File

NM 28355

_____1 - Permit/CD
_____2 - AO & AO matl
_____3 - DMR's
_____4 - Vio. Sum. Log
_____5 - NCR
_____✓6 - Correspondence
_____7 - CRAS
_____Date Filed
_____Clerk's Inits.

117190

Los Alamos
NATIONAL LABORATORY
EST.1943

Environmental Protection Division
Water Quality & RCRA (ENV-RCRA)
P.O. Box 1663, Mail Stop K490
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

Date: May 19, 2011
Refer To: ENV-RCRA-11-0095
LAUR: 11-10625

Ms. Sonia Hall
USEPA Region 6
Compliance Assurance & Enforcement Division
Water Enforcement Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Ms. Hannah Branning
USEPA Region 6
Compliance Assurance & Enforcement Division
Water Enforcement Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Ms. Hall and Ms. Branning:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, EPA MEETING MINUTES, MARCH 22, 2011

Dear Ms. Hall and Ms. Branning:

On March 22, 2011 representatives from the Los Alamos National Security Inc. (LANS) and the National Nuclear Security Administration (NNSA) met with U.S. Environmental Protection Agency (EPA), Region VI staff. The representatives met to discuss the permittees' National Pollutant Discharge Elimination System (NPDES) Permit Programs for NPDES Outfalls and Storm Water, NPDES Permits No. NM0028355 and NM0030759, respectively. Enclosed for your review are the meeting minutes documenting our discussions (See Enclosure 1).

The permittees would like to thank EPA representatives for taking the time to meet with us on March 22, 2011. Please do not hesitate to call me at (505) 665-6085 or Terrill Lemke at (505) 665-2397 if you have questions or need additional information. Thanks for your assistance.

Sincerely,

Mike Saladen
Water Quality & RCRA Group (ENV-RCRA)

Enclosure: a/s

Cy: Diana McDonald, USEPA/Region 6, Dallas, TX, w/enc.
Bret Larson, USEPA/Region 6, Dallas, TX, w/enc.
Isaac Chen, USEPA/Region 6, Dallas, TX, w/enc.
Jim Davis, NMED, Santa Fe, NM, w/enc.
Glenn Saums, NMED/SWQB, Santa Fe, NM, w/enc.
Gene Turner, LASO-EO, w/enc., A316
Carl A. Beard, PADOPS, w/o enc., A102
J. Chris Cantwell, ADESHQ, w/o enc., K491
Mike Saladen, ENV-RCRA, w/enc., K490, (E-File)
Terrill Lemke, ENV-RCRA, w/enc., K490, (E-File)
Sam Loftin, ENV-RCRA, w/enc., K490, (E-File)
Marc Bailey, ENV-RCRA, w/enc., K490, (E-File)
Cindy Blackwell, LC-LESH, w/enc., A187
ENV-RCRA File, w/enc., K490
IRM-RMMSO, w/enc., A150

ENCLOSURE 1

ENCLOSURE 1

ENV-RCRA-11-0095 LAUR-11-10625

NPDES Permit No. NM0028355, EPA Meeting Minutes, March 22, 2011

Summary

Mike Saladen, Pete Worland, Terrill Lemke, and Sam Loftin, representing Los Alamos National Security Inc. (LANS) and Gene Turner from the National Nuclear Security Administration (NNSA) met with Isaac Chen, Diana McDonald, Sonia Hall, Thea Lomax, Phillip Jennings, Brent Larsen, and Hannah Branning of the U.S. Environmental Protection Agency (EPA), Region VI on March 22, 2011. LANS, NNSA and EPA representatives met to discuss the LANS/NNSA's National Pollutant Discharge Elimination System (NPDES) Permit Programs for NPDES Outfalls and Storm Water, NPDES Permit No. NM0028355 and NM0030759, respectively. Summarized below are the meeting minutes from the meeting.

Quarterly Progress Reports: The NPDES permit for the Los Alamos National Laboratory was issued on August 1, 2007. The permit requires the permittees to submit to EPA and the New Mexico Environment Department (NMED) quarterly progress reports regarding the status of attainment of the water quality standards-based effluent limits. To date, the permittees have submitted fourteen progress reports. A copy of the most recent NPDES Quarterly Progress Report was submitted to EPA and NMED on January 19, 2011. During the March 22, 2011 meeting, the permittees discussed in detail corrective actions completed to bring Laboratory facilities into compliance with more stringent effluent limits for pH, temperature, metals and PCBs.

For the purpose of project execution, NNSA/LANS HAVE divided facilities into five stand alone projects (groups). A summary of each group is provided below:

Group 1

- Sanitary Reclamation Recycling Facility (SERF): A Finding of No Significant Impact (FONSI) was made as a result of an Environmental Assessment conducted under National Environmental Policy Act and issued on August 23, 2010. Additionally, NNSA/LANS received the necessary funding for the SERF in mid February, 2011 and the project is currently in the procurement phase. NNSA/LANS are currently preparing contingency plans in the event the SERF project is delayed. Finally, the Biological Oxygen Demand Study will continue until data is collected in all four seasons.

- TA-3 Power Plant (Outfall 001): The boiler blow-down was re-plumbed to the TA-46 Sanitary Wastewater System (SWWS). The Power Plant will not run generation until all modifications necessary to cool water below discharge limits are in place. A sump in the Power Plant basement has been cleaned a couple of times. The LANS Maintenance Department plans to drain it, clean it again, and apply an epoxy or other impervious liner by the end of July, 2011.

- Strategic Computing Complex (SCC) and the Laboratory Data Communication Center (LDCC) Cooling Towers: The SCC and LDCC cooling tower outfalls (03A027 and 03A199 respectively) do not have metals or polychlorinated biphenyl (PCB) compliance issues. However, the permittees explained that permit language on page 18 of Part I, footnote *1 of the NPDES Permit states in part:"Effluent limitations and monitoring requirements only apply at Outfall 03A027 when effluent from outfall 13S is rerouted and discharged at Outfalls 03A027." This language applies to PCB effluent limits and monitoring requirements. The intent is to apply the PCB limit and monitoring requirements to Outfall 03A027 if treated SWWS wastewater goes through the cooling tower outfall and the permittees do not have issues with this language. The purpose of the SERF project is to allow treated water to be re-circulated and reused in cooling towers to reduce potable water consumption. However, the permit goes on to state, in part: "(Effluent from Outfall 13S shall not be discharged at Outfall 03A027 if such effluent contains detectable PCBs)." The language may restrict the permittees from recycling SERF water. Given the detection limit at parts per quadrillion levels, using the PCB congener method of analysis (EPA 1668) will most certainly result in detectable PCBs. Based on this language, NNSA/LANS will not be able to discharge even if the PCB results are below the effluent limit, because they are "detectable". The permittees requested that the last sentence be eliminated from the permit. A written request will be submitted to EPA. On May 13, 2011 LANS/NNSA received a minor modification that addressed the language change to allow effluent from SERF to be discharged through NPDES Outfall 03A027 if it met interim and final NPDES permit limits for PCBs.

Group 2

- Radioactive Liquid Wastewater Treatment Facility (Outfall 051): The treatment media selected has been shown to be successful in reaching discharge limits for copper and zinc. However, the media is not commercially available and has demonstrated a very short operational life. The treated effluent is required by the permit to be retained and sampled prior to discharge. The steel tanks used for effluent storage have been found to leach and re-contaminate the treated effluent. A new polypropylene 1,000 gallon storage tank has been installed and is in operation. Alternatives in treatment as well as operational changes continue to be explored in hopes of developing an affordable and sustainable, compliant, effluent stream. The Radioactive Liquid Wastewater Treatment Facility (RLWTF) discharged twice during the last quarter of 2010. The RLWTF discharged 898 gallons (3400 liters) on November 18, 2010 and another 898 gallons (3400 liters) on November 22, 2010. Both discharges were in compliance with the new copper and zinc limits. The Whole Effluent Toxicity (WET) sample collected on November 18th passed the WET test.

- TA-55 Cooling Towers (Outfall 03A181): Design work to tie in the cooling tower effluent to the SWWS or SERF cross country line is underway.

- TA-35 National High Magnetic Field laboratory (NHMFL) Cooling Towers (Outfall 03A160): An ion exchange system has been installed and the system is treating water. Effluent water samples have been taken and analysis indicates the effluent is well below permitted discharge limits for all metal analytes; therefore the metals interim measure is considered complete.

Group 3

- TA-53 Los Alamos Neutron Science Center (LANSCE) Cooling Tower (Outfall 03A048): The Laboratory collected an NPDES compliance sample at Outfall 03A048 on December 7, 2010. The sample was sent to an outside laboratory for analysis and results were received on January 3, 2011. Data was verified with no problems noted. This result was above the monthly average permit limit of 10 ug/l, but less than the daily maximum permit limit of 14.0 ug/l. Corrective actions were completed. An alternatives analysis for a final remedy solution to eliminate discharges at LANSCE is complete.

Group 4

- Chemistry and Metallurgy Research (CMR) Air Washers (Outfall 03A021): The final remedy for the CMR is complete. Permit modification to eliminate this outfall is pending.

- Sigma/Beryllium Test Facility Cooling Tower (Outfall 03A022): All construction activities are complete and the system is treating water. The metals interim measure is considered complete.

Group 5

- TA-15 Dual-Axis Radiographic Hydrodynamic Test (DARHT) Cooling Tower/Septic effluent (Outfall 03A185): The DARHT cooling tower and facility septic system was connected to the TA-46 SWWS collection system. Permit modification to eliminate this outfall is pending.

Other Activities

- TA-11 Cooling Tower Outfall (Outfall 03A130): Retention of cooling tower blow-down in tank was completed on April 30, 2010. Permit modification to eliminate the outfall is pending.

- PCB Mitigation Update: The permittees have an ongoing program to remove and replace old equipment containing PCBs. There is still some equipment present that may contain

oil with low levels of PCBs at non-regulated concentrations. As a mitigating action to reduce the potential for oil from old equipment being discharged to the sanitary collection system from building floor drains, the permittees have purchased and distributed Petro Plug devices to selected facilities. These cylindrical devices, when placed into a floor drain, selectively absorb oil while allowing water to pass through the drain. In addition, NNSA/LANS personnel conducted a walk-through inspection of selected buildings at TA-53 to identify locations where oil leaks could accidently be discharged to the sanitary collection system. Selected building drains were identified for possible PCB swipe sampling.

TA-50 RLWTF: The RLWTF has completed numerous changes at the facility to bring the facility into compliance with the very stringent zinc and copper limits by August 1, 2011. During the meeting, the permittees discussed the process changes in detail, and followed up with discussions on the Notices of Planned Change regarding actions taken by the facility. Approval was received to bypass the gravity filter and the TUF and install the pressure media filters (Notice of Change submitted to EPA 2/23/2011), and for the use of magnesium hydroxide instead of calcium hydroxide in the clarifier (Notice of Change submitted to EPA 2/23/2011).

On March 2, 2010 NNSA/LANS submitted the Final Report on Toxicity Reduction Evaluation (TRE) activities at RLWTF for failed whole effluent toxicity (WET) tests. LANS/NNSA previously submitted the TRE Action Plan and Schedule on January 31, 2008 and provided quarterly status reports to EPA. Mr. Worland and Mr. Jennings discussed the facility's WET test results in great detail. The permittees discussed corrective actions completed to address metal toxicity, and potential strategies for identifying non-metalic toxicity. One strategy was to restore hardness back into effluent prior to discharge. EPA representatives indicated that there was some risk of impure hardness constituents being added. Impure hardness may take care of the WET toxicity but add metals back into the system and suggested adding hardness to the WET test at the level of influent water. This guidance is outlined in an EPA document entitled "Technical Support Document for Water Quality-based Toxics Control", dated March, 1991. Mr. Jennings indicated additional measures need to be provided to EPA to get their approval for Pacific EcoRisk Laboratory to restore hardness to the WET tests and in adding hardness to the effluent.

Carbon Filter Units in Water Canyon – Aluminum issue: The permittees submitted an NPDES application for new discharges to surface water under the NPDES program on September 3, 2009. The application covered discharges from carbon treatment units located in Canon de Valle (2 locations) and Martin Spring Canyon for the cleanup of high explosives (HE) in spring water. These treatment units are part of the corrective measures identified in the Corrective Measure Study (CMS) report approved by the New Mexico Environment Department Hazardous Waste Bureau for remediating HE and other contaminants subject to the Compliance

Order on Consent (Consent Order). The treatment of groundwater is only temporary if treatment successfully removes contamination to meet conditions of the Consent Order. Naturally occurring aluminum in the groundwater is above the state surface water quality standard. Mr. Chen indicated he would be required to incorporate an aluminum effluent limit in the NPDES permit because data provided by NNSA/LANS demonstrated that there is a reasonable potential for exceedance of the state water quality standard. Mr. Chen also indicated that the permittees would have to conduct a Use Attainability Analysis (UAA) to petition the EPA and the New Mexico Water Quality Control Commission (NMWQCC) to develop a site specific standard for aluminum. Additionally, the new proposed language in the NMWQCC water quality standards regarding background is currently being reviewed by EPA. It was the understanding by EPA that this "background" language would not be approved by EPA. EPA will put the permit issuance on-hold until LANS/NNSA requests them to move forward on the permit.

NNSA/LANS Response to EPA's NOV (February 2011): The permittees received a Notice of Violation (NOV) from EPA Region 6 on December 7, 2010. The NOV was for Total Residual Chlorine (TRC) exceedances at Outfall 03A048 on June 17, 2010 and September 27, 2010. NNSA/LANS provided a 24 hour verbal notification for each exceedance and submitted the required five day written report to EPA which included remedial actions. This information was also included on the respective Discharge Monitoring Reports (DMRs). A formal written response to the NOV was submitted on February 9, 2011. EPA indicated no additional information was needed.

Outfall Reduction Program: The focus has continued on eliminating outfalls and reducing effluent discharges to the environment. The permittees will be requesting the elimination of NPDES Outfalls 02A129, 03A021, 03A130, and 03A185 from the NPDES Permit and are waiting on NMED to inspect the sites on behalf of EPA. At that time, formal notification will be submitted. Mr. Chen indicated these outfalls could be eliminated under a minor modification to the permit. Based on proposed SERF expansion project, the permittees will significantly reduce flows at Outfalls 001, 03A022, 03A027, and 03A160 by recycling of treated effluent. Outfalls 05A055, 13S, and 051have the potential to become no flow outfalls but will remain in the permit.

NPDES Re-Application: The NNSA/LANS outfall permit will expire in July 31, 2012. The permittees will be required to submit a permit re-application in January 2012 and will be initiating the NPDES Re-Application Project in the next couple of months. Based on past history, NNSA/LANS will need to meet with Isaac Chen to discuss permit strategies in May 2011.

ENCLOSURE 1

ENV-RCRA-11-0095 LAUR-11-10625

NPDES Permit No. NM0028355, EPA Meeting Minutes, March 22, 2011

Storm Water Program, Individual Permit (IP):

Red text indicates permittee's understanding of the answers provided by EPA during the meeting.

1. Overview of LANL IP program

See slides and information provided at time of meeting.

2. Permit Language Clarifications

1. The Permittees identify "soil disturbance" as listed in Sections D.4.(a), E.5.(a), and I.1 to be that as defined in the NPDES Construction General Permit.

Acceptable

- Part II, Section B., 24-Hour Oral Reporting, states "Exceedances of maximum target levels (MTLs) for any applicable pollutants shall be reported orally to EPA Region 6…".
- The Permittees identify this requirement to be exceedances of MTALs.

Yes, this section is referencing MTALs.

- Part III, D.7, Twenty-Four Hour Reporting, identifies reporting any noncompliance which may endanger health or the environment within 24 hours of the event, and requires a follow-on written notification within 5 days.

- A 24-hour notification is also identified Part II, Section B. However, it is the Permittees interpretation that the Part III notification is distinct from the Part II notification, and that a 5-day report is not required for the Part II 24-hour notification since an MTAL exceedance is not a Permit noncompliance which endangers health or the environment, as specified in Part III.

A 5-day report is not required for an MTAL exceedance. It was also recommended by EPA personnel that when making the required 24-hour notification that the notifications be made orally using the notification phone number and not the optional email.

- Given the Permit timeframes for required completion of corrective actions, the Permittees may implement additional control measures at a site that augment the initial certified Baseline Control Measures, prior to the collection of the two baseline confirmation samples required by Section I.D.1.

- Based on the requirements in Section B.1 for initial certification of Baseline Control Measures, additional certification of these augmented baseline control measures will not be performed.

Additional certification is not required.

- In order to designate a Site as "No Exposure", the Permittees would like to use the MSGP criteria identified on the MSGP "No Exposure Certification" form.

Use of the MSGP "No Exposure" criteria and certification form as the basis for establishing criteria and documentation of "No Exposure" for IP sites was acceptable. Since most of the potential "no exposure" sites would most likely be former outfalls, it was also recommended by EPA personnel that some additional criteria specific to outfalls be created.

3. Clarification of Monitoring Requirements

1. Section D.3 states that, "Samples shall not be used if the collected volume of sample is insufficient to perform all required analyses".

    - If confirmation samples are missing results for some pollutants due to preservation error, bottle breakage during shipment, or analytical laboratory error, the Permittees would like to be able to recollect only the sufficient volume needed to replace the missing analytical results.

If any confirmation samples are missing results the full volume must be recollected. Sample results can't be mixed as parts of two different samples (storm events) can't be used to be a representative sample for a site.

2. Section D.2 identifies that Permittees may move a sampler, without Permit modification, to make minor adjustments to ensure that the sample location is representative.

    - The Permittees have identified the following criteria for minor adjustments:
        - Moving a sampler in response to updated information on Site boundaries (same receiving water).
        - Moving a sampler in response to changes in storm water drainage patterns brought about by implementation of Baseline Control Measures, Corrective Actions, or construction/remediation activities.
        - The Permittees have identified that the following criteria would require Permit modification.

- Moving a sampler to a new location such that storm water discharges to a different receiving water.
- Addition of a new Site or corresponding SMA to the Permit.

The permittees sought clarification regarding "minor adjustments" that will not require the permit to be modified under Section D.2. EPA personnel (Diana McDonald) agreed to contact EPA counsel to seek clarification.

4. Permit Modification Logistics

1. How should the Permittees request a minor Permit modification to correct typographical errors?

    - For example, Site No. 46-004(e2) was inadvertently assigned to CDB-SMA-0.55 in Appendix A due to typographical error. 46-004(e2) should be assigned to CDB-SMA-0.25.

Requests for such minor permit modifications should be sent in writing to Isaac Chen. Such requests should also include the permit required email notification to the public.

2. Section D.2 of the Permit identifies that a major Permit modification is required for non-minor SMA relocation, and that a technical justification is to be submitted to EPA.

It was noted in discussion that the reference above to an SMA relocation being a major modification may be an error as EPA personnel thought this to be a minor modification. 40 CFR 122 or 125 was provided as a reference for definition of the type of permit modifications.

What kind of information and level of detail is required for justification?

Technical justification, in writing, and a new site map providing detail on the request.

What is the process for major Permit modification?

Major modification would be just like opening a new permit.

To facilitate planning purposes, what is the timeframe for a major Permit modification?

Permittees should allow 30 days for minor permit modification requests sent to Isaac Chen. Given the nature of major modifications (like a new permit) timeframes for these modifications cannot be accurately estimated. Major modifications are unlikely, however.

Can we perform initial monitoring at the new location pending Permit modification?

It was agreed upon that monitoring at the new location could be initiated pending permit modification. However, it was recommended that sampling capabilities at the old locations be maintained until approval of the new locations was granted, just in case the request was disapproved.

5. Communication & Correspondence

1. Could EPA please provide points of contact for technical questions and issues associated with the following areas:
    - Submission of required deliverables

Sonia Hall. Hard copy of deliverables sent to Sonia and an electronic copy sent to Isaac Chen.

- Permit modifications

Isaac Chen. For anything sent to Isaac, Sonia Hall is to receive an electronic copy.

- Storm water monitoring issues (sample collection, analytes and test methods, etc.)

Diana McDonald and Jana Harvill

- Site-specific MQLs

Isaac Chen. For general permit questions and clarifications, Isaac Chen or Diana McDonald, depending on the item should be contacted.

2. With regard to the submission and transfer of Permit deliverables:

    - Is the use of an electronic signature acceptable, and if so are there any restrictions or specific requirements?

Electronic signatures are acceptable on DMRs only. There is no software or other specific requirements.

Is the use of an FTP site for delivery of documents acceptable or feasible?

No. Deliverables need to be provided in CD or hard copy format due to EPA record keeping needs and to facilitate potential FOIA requests.
How are certification signatures that are scanned as part of a document and sent electronically protected?

Such signatures are kept with EPA's records. No additional security measures.

External Correspondence Traveler

Los Alamos NATIONAL LABORATORY EST. 1943

Document Identification				
ESH&Q. #:		Enclosures:	Attachments:	LAUR No.
ENV-Group:	ENV-RCRA	Yes: ☑	Yes: ☐	11-10625
Doc. #:	11-0095	No: ☐	No: ☐	
Is this a response to an action item		Yes: ☐	No: ☑	
Email ☐	Document Date:	~~05/11/2011~~ 5/19/11		
Memo ☐	Due Date:			
Letter ☑				

To:	Sonia Hall & Hannah Branning
Subject:	NPDES Permit No. NM0028355, EPA Meeting Minutes, March 22, 2011
Action:	
Background / Issues	

Authorizing Official	*Name*		Date
From (Ghost Writer)	Mike Saladen	Mike Saladen	5/12/11
Author	Mike Saladen	for 5/12/11	
Group Leader	Anthony R. Grieggs	Tina Marie Sandoval for	5/20/2011
Deputy Group Leader	Tina Marie Sandoval		
Division Leader	Dennis L. Hjeresen		
ADC Review			
DUSA / SAFE-7			
LC-LESH Review			
Coordinated with Facility or Program			
Comments:	marc - will send E-File		

Hand Deliver: ☐ **Express Mail** ☐ **FedEX:** ☐ **CRRR:** ☐ **Regular Mail Service:** ☐

Group Office Use Only

Final Distribution: Raeella		**Scanned by:** Raeella	
Time: 10:45	**Date:** 5/20/11	**Date:**	
		Logged by:	
Distribution to IRM-RMMSO, A150:		**Date:** 5/20/11	
Time: 10:45	**Date:** 5/20/11	E-File sent	

Environmental Protection Division
Water Quality & RCRA Group (ENV-RCRA)
P.O. Box 1663, K490
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: April 18, 2011
Refer To: ENV-RCRA-11-0076
LAUR: 11-10404

Ms. Hannah Branning
U.S. Environmental Protection Agency, Region 6
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN-WC)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

1 - Permit/CD
2 - AO & AO matl
3 - DMR's
4 - Vio. Sum. Log
5 - NCR
✓ 6 - Correspondence
7 - CRAS
Date Filed
Clerk's Inits.

Received
APR 25 2011
6EN-W
MAY 1

Dear Ms. Branning:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NO. NM0028355, QUARTERLY PROGRESS REPORT (JANUARY 1, 2011 – MARCH 31, 2011)

The NPDES Permit No. NM0028355 issued to the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) for the Los Alamos National Laboratory requires the permittees to submit quarterly progress reports to the U. S. Environmental Protection Agency (EPA) regarding the status of attainment of the state water quality standards–based effluent limits. This letter and Enclosure 1 serves as the fifteenth Quarterly Progress Report for the performance period January 1, 2011 – March 31, 2011. The information in Enclosure 1 was provided by the responsible managers for each activity.

Please contact Mike Saladen, LANS at (505) 665-6085 or Gene Turner, NNSA at (505) 667-5794 if you need additional information concerning the status of the Laboratory's corrective action activities.

Sincerely,

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group
Los Alamos National Laboratory

Sincerely,

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

ARG:GT:MS/lm

Enclosure: a/s

Cy: Richard Powell, NMED/SWQB, Santa Fe, NM, w/enc.
George Rael, LASO-EO, w/enc., A906
Gene Turner, LASO-EO, w/enc., A316
Juan Griego, LASO-NSM, w/enc., A316
Isaac Valdez, LASO-NSM, w/enc., A316
Michael Mallory, PADOPS, w/o enc., A102
J. Chris Cantwell, ADESHQ, w/o enc., K491
Ken Schlindwein, IP-DO, w/enc., M895
Craig Leasure, PADWP, w/enc., A107
Craig Bachmeier, IPM-4, w/enc., J520
Jeffrey Schroeder, SP-PGIU, w/enc., J590
Mike Saladen, ENV-RCRA, K490, w/enc., (E-File)
Marc Bailey, ENV-RCRA, K490, w/enc., (E-File)
Albert Dye, ENV-RCRA, K490, w/enc., (E-File)
Robert Wingo, C-CDE, w/enc., J964
Cindy Blackwell, LC-LESH, w/enc., A187
ENV-RCRA File, w/enc., K490
IRM-RMMSO, w/enc., A150

ENCLOSURE 1

Mike Saladen, Pete Worland, Terrill Lemke, and Sam Loftin, Los Alamos National Security Inc. (LANS) and Gene Turner, National Nuclear Security Administration (NNSA) met with Isaac Chen, Diana McDonald, Sonia Hall, Thea Lomax, Phillip Jennings, Brent Larsen, and Hannah Branning of the U.S. Environmental Protection Agency (EPA), Region VI on March 22, 2011. LANS, NNSA and EPA representatives met to discuss the LANS/NNSA's National Pollutant Discharge Elimination System (NPDES) Permit Programs for NPDES Outfalls and Storm Water, NPDES Permit Nos. NM0028355 and NM0030759, respectively. Summarized below are activities discussed during the meeting.

Quarterly Progress Reports: The LANS/NNSA's NPDES permit became effective on August 1, 2007. The NPDES permit requires the permittees to submit to EPA and the New Mexico Environment Department (NMED) quarterly progress reports regarding the status of attainment of the water quality standards-based effluent limits. To date, LANS/NNSA has submitted fifteen progress reports. Mr. Saladen provided a copy of the NPDES Quarterly Progress Report submitted to EPA and NMED on January 19, 2011. Mr. Saladen discussed in detail corrective actions completed by the permittees to bring LANS/NNSA facilities into compliance with more stringent effluent limits for pH, temperature, metals and PCBs.

LANS divided facilities into five stand alone projects (groups). A summary of each group is provided below:

Group 1:

- Sanitary Reclamation Recycling Facility (SERF)/TA-46 Sanitary Wastewater System (SWWS), Outfall 13S: NEPA Environmental Assessment Finding of No Significant Impact (FONSI) was issued on August 23, 2010. Additionally, LANS received capital money in mid February 2011. The project is currently in the procurement phase. The Request for Proposal (RFP) for a Design Build contract went out February 23, 2011. The pre-bid meeting was held on March 8th and bids are due mid April. LANS is preparing contingency plans if the SERF project is delayed. Finally, a Biological Oxygen Demand Study at the SWWS Plant is ongoing and will continue until data is collected in all four seasons. LANS will then determine if this process will continue as a permanent treatment process.

- TA-3 Power Plant (Outfall 001): The boiler blow-down was re-plumbed to the TA-46 Sanitary Wastewater System (SWWS). The Power Plant will not run generation until all modifications necessary to cool water below discharge limits are in place. A sump in the Power Plant basement has been cleaned a couple of times. The Laboratory's Maintenance Department plans to drain it, clean it again, and apply an epoxy or other impervious liner by the end of July 2011.

- Strategic Computing Complex (SCC) and the Laboratory Data Communication Center (LDCC) Cooling Towers (03A027 and 03A199 respectively): The SCC and LDCC cooling tower outfalls do not have a metals or PCB compliance issues. However, Mr. Saladen explained that permit language on page 18 of Part I, footnote *1 of the NPDES Permit states in part:"Effluent limitations and monitoring

ENCLOSURE 1

requirements only apply at Outfall 03A027 when effluent from outfall 13S is rerouted and discharged at Outfalls 03A027." This language applies to PCB effluent limits and monitoring requirements. The intent applies to adding the PCB limit and monitoring requirements to Outfall 03A027 if treated SWWS wastewater goes through the cooling tower outfall. LANS/NNSA do not have issues with this language. The intent of the SERF project is to allow treated SERF water to be re-circulated and reused in cooling towers to reduce potable water consumption. However, the permit goes on to state, in part: "(Effluent from Outfall 13S shall not be discharged at Outfall 03A027 if such effluent contains detectable PCBs)." The language may restrict LANS/NNSA from recycling SERF water. Using the PCB congener method of analysis will most likely result in detectable PCBs. Based on this language, LANS/NNSA may not be able to discharge through Outfall 03A027 even if the PCB results are below the compliance effluent limit, because they are "detectable". Mr. Saladen requested that the last sentence be eliminated from the permit. A written request will be submitted to EPA.

Group 2:

- Radioactive Liquid Wastewater Treatment Facility (RLWTF), Outfall 051: The RLWTF has completed numerous changes at the facility to bring the facility into compliance with the very stringent zinc and copper limits by August 1, 2011. Mr. Worland discussed the process changes in detail. Mr. Saladen followed up with discussions on the Notices of Planned Change regarding actions taken by the facility. Approval was received to bypass the gravity filter and the TUF and install the pressure media filters (Notice of Change submitted to EPA 2/23/2011), and for the use of magnesium hydroxide instead of calcium hydroxide in the clarifier (Notice of Change submitted to EPA 2/23/2011).

- On March 2, 2010 NNSA/LANS submitted the Final Report on Toxicity Reduction Evaluation (TRE) activities at RLWTF for failed whole effluent toxicity (WET) tests. LANS/NNSA previously submitted the TRE Action Plan and Schedule on January 31, 2008 and provided quarterly status reports to EPA. Mr. Worland and Phillip Jennings, an EPA toxicity expert, discussed the facility's WET test results in great detail. Mr. Worland discussed corrective actions completed to address metals toxicity, and potential strategies for identifying non-metalic toxicity. One strategy was to restore hardness back into effluent prior to discharge. Mr. Jennings indicated that there was some risk of impure hardness constituents being added. Impure hardness may take care of the WET toxicity but add metals back into the system. Mr. Jennings suggested adding hardness to the WET test at the analytical laboratory to the level of the RLWTF influent water. Mr. Jennings talked about an EPA guidance document which discusses this procedure. Additional measures will need to be provided to EPA to get their approval for Pacific EcoRisk Laboratory to restore hardness to the WET tests , and in adding hardness to the effluent. Mr. Jennings

ENCLOSURE 1

offered his support in assisting RLWTF representatives through the justification process. On March 28, 2011 LANS/NNSA provided an update on the evaluation of technologies for the removal of toxicity caused by organics in the RLWTF effluent. The March 28th letter outlined a path forward for potential corrective actions, including timelines for completion.

- TA-55 Cooling Towers (Outfall 03A181): Design work to tie in the cooling tower effluent to the SWWS or SERF cross country line is underway.

- TA-35 National High Magnetic Field laboratory (NHMFL) Cooling Tower (Outfall 03A160): An ion exchange system has been installed and the system is treating water. Effluent water samples have been taken and analysis indicates the effluent is well below permitted discharge limits. The metals interim measure is considered complete.

Group 3:

- TA-53 LANSCE Cooling Tower (Outfall 03A048): The Laboratory collected an NPDES compliance sample at Outfall 03A048 on December 7, 2010. The arsenic sample was sent to an outside laboratory for analysis and results were received on January 3, 2011. This result was above the monthly average permit limit of 10 ug/l, but less than the daily maximum permit limit of 14.0 ug/l. Corrective actions have been completed and the effluent is below permit limits. An alternatives analysis for a final remedy solution to eliminate discharges at LANSCE is complete.

Group 4:

- Chemistry and Metallurgy Research (CMR) Air Washers (Outfall 03A021): The final remedy for the CMR is complete. Permit modification to eliminate this outfall is pending.

- Sigma/Beryllium Test Facility Cooling Towers (Outfall 03A022): All construction activities are complete and the system is treating water. The metals interim measure is considered complete.

Group 5:

- TA-15 Dual-Axis Radiographic Hydrodynamic Test (DARHT) Cooling Tower/Septic Effluent (Outfall 03A185): The DARHT cooling tower and facility septic system were connected to the TA-46 SWWS collection system. A permit modification to eliminate this outfall is pending.

ENCLOSURE 1

Other Activities:

- TA-11 Cooling Tower (Outfall 03A130): Project completed on April 30, 2010. Permit modification to eliminate the outfall is pending.

- PCB Mitigation Update: The permittees have an ongoing program to remove and replace old equipment containing PCBs. There is still some equipment present that may contain oil with low levels of PCBS at non-regulated concentrations. As a mitigating action to reduce the potential for oil from old equipment being discharged to the sanitary collection system from building floor drains, the Laboratory purchased and distributed Petro Plug devices to selected facilities. These cylindrical devices when placed into a floor drain selectively absorb oil while allowing water to pass through the drain. In addition, Laboratory personnel conducted a walk-through inspection of selected buildings at TA-53 to identify locations where oil leaks could accidently be discharged to the sanitary collection system. Selected building drains were identified for possible PCB swipe sampling.

- Program Budgets Authorized, to date: Outfall Reduction at the Laboratory has authorized up to $15.2M for the projects identified above exclusive of the SERF Expansion Project (SERF-E). SERF-E has been authorized at $1.1M in preparatory funding to date and new Line Item budget authorization has been requested for Fiscal Year (FY) 11 funding at $15M. Final remedies in most cases have not yet been estimated.

- LANL Response to EPA's NOV (February 2011): LANS/NNSA received a Notice of Violation (NOV) from EPA Region 6 on December 7, 2010. The NOV was for Total Residual Chlorine (TRC) exceedances at Outfall 03A048 on June 17, 2010 and September 27, 2010. The Laboratory provided a 24 hour verbal notification for each exceedance and submitted the required five day written report to EPA which included remedial actions. This information was also included on the respective Discharge Monitoring Reports (DMRs). A formal written response to the NOV was submitted on February 9, 2011. EPA indicated no additional information was needed.

- Outfall Reduction Program: The Laboratory has continued to work on eliminating outfalls and reducing effluent discharges to the environment. The Laboratory will be requesting the elimination of NPDES Outfalls 02A129, 03A021, 03A130, and 03A185 from the NPDES Permit. Formal notification will be submitted to EPA. Mr. Chen indicated he could eliminate these outfalls under a minor modification to the permit. Based on proposed SERF-E project, the LANS/NNSA will significantly

ENCLOSURE 1

reduce flows at Outfalls 001, 03A022, 03A027, and 03A160 by recycling treated effluent. Outfalls 05A055, 13S, and 051 have the potential to become no-flow outfalls but will remain in the NPDES permit.

- NPDES Re-Application: The LANS/NNSA permit will expire in July 31, 2012. LANS/NNSA will be required to submit a permit re-application in January 2012. Mr. Saladen indicated that LANS/NNSA will be initiating the NPDES Re-Application Project in the next couple of months. Based on past history, LANS/NNSA will need to meet with Mr. Chen to discuss permit strategies in May 2011.

Environmental Protection Division
Water Quality & RCRA Group (ENV-RCRA)
P.O. Box 1663, K490
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: March 29, 2011
Refer To: ENV-RCRA-11-0059
LAUR: 11-10291

1 - Permit/CD
2 - AO & AO matl
3 - DMR's
4 - Vio. Sum. Log
5 - NCR
V 6 - Correspondence
7 - CRAS
Date Filed
Clerk's Inits.

MAY 1

RECEIVED
APR 0 4 2011
6EN-W

Ms. Hannah Branning
U.S. Environmental Protection Agency, Region 6
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6EN)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Dear Ms. Branning:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT NO. NM0028355, WHOLE EFFLUENT TOXICITY (WET) PROGRESS REPORT

The NPDES Permit No. NM0028355 issued to the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) for the Los Alamos National Laboratory requires the permittees to submit a WET progress report to the U. S. Environmental Protection Agency (EPA) regarding the status of attainment of the State water quality standards–based effluent limits. NNSA/LANS submitted a Toxicity Reduction Evaluation (TRE) Action Plan and Schedule for the failed Whole Effluent Toxicity (WET) retest at the TA-50 Radioactive Liquid Waste Treatment Facility's Outfall 051 in January 2008. The final report on TRE activities was submitted to EPA on March 2, 2010. Enclosure 1 provides an update on the evaluation of technologies for the removal of toxicity caused by organics in the TA-50 Radioactive Liquid Wastewater Treatment Facility (RLWTF) effluent. Enclosure 1 also outlines a path forward for potential corrective actions, including timelines for completion.

Please contact Mike Saladen, LANS at (505) 665-6085 or Gene Turner, NNSA at (505) 667-5794 if you need additional information concerning the status of the Laboratory's corrective action activities.

Sincerely,

for Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group
Los Alamos National Laboratory

Sincerely,

Gene E. Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

Enclosures: a/s

ARG:GT:MS/lm

Cy: Isaac Chen, USEPA/Region 6, Dallas, TX, w/enc.
Richard Powell, NMED/SWQB, Santa Fe, NM, w/enc.
George Rael, LASO-EO, w/enc., A906
Juan Griego, LASO-NSM, w/enc., A316
Isaac Valdez, LASO-NSM, w/enc., A316
Michael Mallory, PADOPS, w/o enc., A102
J. Chris Cantwell, ADESHQ, w/o enc., K491
Hugh McGovern, TA-55-RLW, w/enc., E518
Pete Worland, TA-55-RLW, w/enc., E518
Mike Saladen, ENV-RCRA, w/enc., K490, (E-File)
Marc Bailey, ENV-RCRA, w/enc., K490, (E-File)
Cindy Blackwell, LC-LESH, w/enc., A187
ENV-RCRA File, w/enc., K490
IRM-RMMSO, w/enc., A150

Los Alan tional Laboratory NPDES Permit N 0028355
Outfall 051 Whole Effluent Toxicity Progress Report March 2011

Statement of Purpose

The purpose of this paper is to respond to Corrective Action #3 as submitted to USEPA by the National Nuclear Security Administration and Los Alamos National Security, LLC (NNSA/LANS) in the March 2, 2010 Outfall 051 Final Report Toxicity Reduction Evaluation Activities[1]. Corrective Action #3 states that the Permittees will evaluate technologies for the removal of toxicity caused by organics in the RLWTF effluent. This evaluation will be based upon Corrective Action #1 which states that NNSA/LANS will task Pacific EcoRisk (PER) to provide confirmatory information regarding the role of copper as the cause of toxicity and to investigate further the non-metal contaminant that may be contributing to the toxicity.

Introduction

NPDES Permit No. 0028355 requires that the Radioactive Liquid Waste Treatment Facility (RLWTF) Outfall 051 effluent undergo Whole Effluent Toxicity (WET) testing using the freshwater crustacean *Daphnia pulex*. During the time period from January 2007 to November 2010, Pacific EcoRisk (PER) has performed twenty-four (24) compliance and operational WET tests on RLWTF effluent. The "No Observable Effect Concentration" (NOEC) is 100% effluent since the RLWTF discharges to a dry canyon. Nine (9) of these discharges passed the WET test. PER has also performed seven (7) Phase I Toxicity Identification Evaluations (TIE) and one (1) Phase II TIE in the effort to determine the source of the toxicity in the RLWTF effluent. In addition, PER has prepared a paper titled, An Evaluation of the Role of "Hardness" in the Amelioration and/or Exacerbation of LANL Outfall 051 Effluent Toxicity[2].

WET testing and TIE Results

Three sources of toxicity in the RLWTF effluent have been identified by PER as a result of the twenty-four (24) WET tests and eight (8) TIEs performed during the January 2007 through November 2010 time period:

- Metals (prominently copper and zinc)
  During this time period, copper and zinc concentrations in the RLWTF effluent averaged around 40 ppb and 15 ppb, respectively. Toxicity due to metals in the RLWTF effluent was indicated in seven of the eight TIEs. The five TIEs performed on effluents having NOECs less than 32% all identified metals (copper and zinc) as the primary source of effluent toxicity. Three of these TIEs indicated metals as the sole source of toxicity. Beginning in August 2010, a new ion exchange treatment system (using experimental, non-commercially available media) was brought into service at the RLWTF to treat this effluent. The system has proved capable of reducing the concentrations of copper and zinc in the RLWTF effluent to < 0.14 part per billion (ppb) and <2.2 ppb, respectively, which are the applicable NPDES discharge limits. Due to the slow kinetics of the ion exchange reaction the system is not capable of keeping up with the flow rate through the RLWTF. As a result, a boiler has been installed to evaporate the RLWTF effluent.

- Non-metals (likely organic)
  Minor non-metal toxicity in the RLWTF effluent was indicated in five of the TIEs. In two of these TIEs, metals were the primary source of toxicity. Two other TIEs indicated that the low toxicity

of the effluent was equally split between metals and non-metals. The fifth TIE suggested that the low toxicity of the effluent was not persistent (possibly due to a non-metal constituent that quickly volatized from the effluent or which adsorbed to the sample bottle).

- Extremely Low Hardness (exacerbates toxicity of metals)

Low hardness was characteristic of all eight of the effluent samples on which TIEs were performed. Six of the TIEs were performed on effluent with zero (0) mg/L hardness, expressed as $CaCO_3$. The hardness was 3 mg/L and 10 mg/L in the other two TIE tests. Influent water to the RLWTF passes through two treatment processes that remove "hardness" (predominantly calcium and magnesium): a clarifier (which precipitates calcium and magnesium) and reverse osmosis (which removes calcium and magnesium ions from the permeate stream). The toxicity of trace metals (like copper and zinc) to daphnids is exacerbated in low hardness waters[2]. Additionally, low hardness waters have been shown to be stressful to daphnid organisms[2].The WET tests and TIEs suggest that the toxicity, when it is present in the RLWTF effluent water, is due primarily to metals (copper and zinc). It appears that this toxicity is exacerbated by the low hardness of the effluent. To a lesser degree, some portion of the toxicity may be due to a non-metal contaminant that is likely organic in nature.

Organics in RLWTF Effluent

The focus of this paper is to evaluate technologies for the removal of toxicity caused by organics in the RLWTF effluent. Fundamental to this evaluation is the determination of what organics exist in the RLWTF effluent. RLWTF effluent is analyzed for Total Toxic Organics (TTO) which is composed of eighty-six (86) volatile and semi-volatile organic compounds. Also, the Chemical Oxygen Demand (COD) of the RLWTF effluent is determined. These two parameters, TTO and COD, provide information on the organic content of the RLWTF effluent.

Thirteen (13) effluent samples were analyzed for TTO in 2009[3]. Each of these samples was analyzed for the 86 TTO compounds. Of these 1,118 analyses, just 15 (1.3%) were found to exceed the minimum detection level. Each of the fifteen chemicals were detected just once with no detection of any chemical exceeding 1.32 ppb. The RLWTF annual reports during 2006 through 2009[4,5,6] indicate that the average organic concentration from the eight-six (86) TTO chemicals in the RLWTF effluent is about three (3) ppb. The NPDES permit allows 1,000 ppb of TTO in the RLWTF effluent.

Chemical Oxygen Demand (COD) is used to measure the oxygen equivalent of the organic and inorganic material in water that can be oxidized chemically. The carbon atoms in organic molecules are converted to carbon dioxide. Reduced inorganic substances like ferrous iron are oxidized to ferric iron and molecules like ammonia or nitrite which contain nitrogen in a reduced state are oxidized to nitrate.

RLWTF annual reports during 2006 through 2009[3,4,5,6] indicate that the average COD in the RLWTF effluent was 18.5 mg/L during this time period. The NPDES discharge requirement for COD in the RLWTF effluent is 125 mg/L. During the time period the average Total Kjeldahl Nitrogen (TKN, which is a measure of ammonia nitrogen and organic nitrogen) averaged 4.84 mg/L (or 11.1 mg/L expressed as

COD). Additionally, nitrite-nitrogen concentrations during this same time frame averaged 1.57 mg/L (or 1.8 mg/L expressed as COD).

Thus, only 5.6 mg/L or 30% of the COD (5.6 mg/L = 18.5 – 11.1 – 1.8) in the RLWTF effluent is due to suspected organic molecules. The TTO compounds detected in the 3 ppb concentration range in the RLWTF effluent in 2009 are primarily polycyclic aromatic hydrocarbons like acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, etc.[3] The 3 ppb of Total Toxic Organics (TTO) in the RLWTF effluent would account for, at the most, 0.1 mg/L of the total COD in the effluent. The organic compounds which account for the remaining 5.5 mg/L of COD in the RLWTF effluent have not been identified.

Organic Removal Technologies

Removal of organic molecules from water can be accomplished in a number of ways: adsorption, coagulation/flocculation/sedimentation, air stripping, chemical oxidation, advanced oxidation processes and biologically[7,8,9,10]. Each technology would need to be evaluated at benchtop and pilot scale prior to implementation at the RLWTF.

1. Activated Carbon Adsorption
   The ability of activated carbon to remove a broad spectrum or organic compounds from water is well documented. A wide range of organic compounds of different structures, sizes and functionalities can be adsorbed by activated carbon. The activated carbon can be used in granular or powdered forms.

2. Enhanced Coagulation
   The use of inorganic coagulants along with coagulant aids can be used to optimize the removal or organic material from a waste water stream. The RLWTF treatment process employs a clarifier as its first unit operation. Enhanced coagulation could be studied in this unit operation.

3. Air Stripping
   If the organic molecule is volatile, it can be "stripped" from the water by passing air through the water. The molecule will partition to the air phase and thereby be removed from the water phase.

4. Chemical Oxidation
   Chemical oxidation destroys the organic compounds by breaking the compounds atomic bonds and converting the reduced form of carbon in the organic molecule into carbon dioxide gas which then will volatilize from the water. Chemical oxidants commonly used are: chlorine, ozone, hydrogen peroxide, chlorine dioxide and permanganate.

5. Advanced Oxidation Processes (AOP)
   Advanced oxidation processes are similar to chemical oxidation in that reduced carbon atoms are converted to carbon dioxide gas. AOP processes, though, generate hydroxyl "free" radicals

which are especially powerful oxidizers. AOP processes include: ozone/UV, ozone/hydrogen peroxide and hydrogen peroxide/UV.

6. Bioreactors
   Microorganisms are effective in the removal of organics from wastewater streams. This technology is the primary technology used to remove the high organic load from sanitary wastewater streams. The organisms can be suspended in the wastewater or fixed to a media through which the wastewater is moved.

Path Forward

Corrective Action #3 as submitted to USEPA by the Permittees in the March 2, 2010 Outfall 051 Final Report Toxicity Reduction Evaluation Activities[1] states that NNSA/LANS will evaluate technologies for the removal of toxicity caused by organics in the RLWTF effluent. This evaluation will be based upon Corrective Action #1 which states that LANL will task Pacific EcoRisk (PER) to provide confirmatory information regarding the role of copper as the cause of toxicity and to investigate further the non-metal contaminant that is contributing to the toxicity.

The results of PER WET tests and TIEs indicate that the source of the toxicity in the RLWTF effluent is variable. The source of toxicity is primarily metallic in nature (prominently due to copper and zinc). The low hardness of the RLWTF effluent exacerbates the toxicity of these metals. The PER studies have also found that non-metal (likely organic in nature) contaminants sometimes are a minor contributor to the effluent toxicity.

As a result of these studies, the Permittees propose that the following path be pursued to eliminate toxicity from the RLWTF effluent:

1. Develop a protocol to restore "hardness" in the RLWTF effluent WET tests to the levels found in LANL tapwater as per EPA guidance[11].
   Date of Completion: 2 months from EPA approval

2. Evaluate WET test results on RLWTF operational and compliance effluent samples when "hardness" is restored in the WET test water to the natural concentrations found in LANL tapwater.
   Date of Completion: 6 months from EPA approval

3. If Steps #1 and #2 are effective in reducing the toxicity of RLWTF effluent water, then
   a. Develop a protocol to restore "hardness" in the RLWTF effluent water to the levels found in LANL tapwater as per EPA guidance[11].
      Date of Completion: 8 months from EPA approval
   b. Allow the RLWTF to restore "hardness" to the natural concentrations in LANL tapwater prior to discharging to Outfall 051.
      Date of Completion: 12 months from EPA approval

c. Evaluate WET test results on RLWTF operational and compliance effluent samples when the RLWTF restores "hardness" to the natural concentrations in LANL tapwater while discharging to Outfall 051.
Date of Completion: 12 months from EPA approval

4. Perform TIEs on operational or compliance effluent samples to determine the identity of any non-metallic source of toxicity in RLWTF effluent.
Date of Completion: 12 months from EPA approval

References

[1] Los Alamos National Laboratory, NPDES Permit No. NM0028355, Outfall 051 Final Report Toxicity Reduction Evaluation Activities, ENV-RCRA-10-044, LAUR 10-01176. To: Ms. Sonia Hall, USEPA Region 6 and Mr. Richard Powell, NMED. From: Mr. Anthony Grieggs, LANL and Mr. Gene Turner, Los Alamos Site Office, NNSA.

[2] An Evaluation of the Role of "Hardness" in the Amelioration and/or Exacerbation of LANL Outfall 051 Effluent Toxicity, Pacific EcoRisk, February 23, 2011.

[3] Radioactive Liquid Waste Treatment Facility Annual Report for 2009, J.C. Del Signore and R.L. Watkins, February 2011, LA-UR-11-01005.

[4] Radioactive Liquid Waste Treatment Facility Annual Report for 2006, J.C. Del Signore and R.L. Watkins, May 2007, LA-UR-07-3447.

[5] Radioactive Liquid Waste Treatment Facility Annual Report for 2007, J.C. Del Signore and R.L. Watkins, June 2008, LA-UR-08-03779.

[6] Radioactive Liquid Waste Treatment Facility Annual Report for 2008, J.C. Del Signore and R.L. Watkins, December 2010, LA-UR-11-00269.

[7] Chemistry of Water Treatment, 2nd Edition, S.D. Faust and O.M. Aly, 1998, Ann Arbor Press.

[8] Significance and Treatment of Volatile Organic Compounds in Water Supplies, N.M. Ram, R.F. Christman and K.P. Cantor, 1990, Lewis Publishers.

[9] Wastewater Engineering Treatment and Reuse, 4th Edition, Metcalf and Eddy, Inc., 2003, McGraw-Hill.

[10] Opflow, , Monitor Source Water UV_{254} to Enhance Operations, Alex Yavich and Jim Van de Wege, February 2011, pages 16-18.

[11] EPA Technical Support Document for Water Quality-Based Toxics Control, 2nd printing, June 5, 1992, EPA/505/2-90-001, PB91-127415 March 1991, EN-336, Section 3.3.6, page 61.

Environment, Safety, Health & Quality
P.O. Box 1663, K491
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

1 - Permit/CD
2 - AO & AO matl
3 - DMR's
4 - Vio. Sum. Log
5 - NCR
6 - Correspondence
7 - CRAS
Date Filed
Clerk's Inits.

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: February 23, 2011
Refer To: ENV-RCRA-11-0027
LAUR: 11-00881

Ms. Mary Simmons
U.S. Environmental Protection Agency, Region 6
Compliance Assurance and Enforcement Division
Water Enforcement Branch (6SF)
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Received
MAR 07 2011
6EN-W

Dear Ms. Simmons:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, NOTICE OF PLANNED CHANGE AT NPDES OUTFALL 051

The National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 for the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) requires the permittee(s) to notify the U. S. Environmental Protection Agency (EPA) regarding any physical alterations or additions to the permitted facility that could significantly change the nature or increase the quantity of pollutants discharged (see Part III.D.1.a. *Reporting Requirements*).

The Radioactive Liquid Waste Treatment Facility (RLWTF) is making modifications to the low-level wastewater treatment system. Modifications include installing pipes and components to bypass the existing RLWTF gravity sand filter and tubular ultra-filter and replace the bypassed treatment processes with a pressure media filtration and cartridge filtration capability. The installation of these new filtration capabilities will provide the RLWTF with reliable filtration downstream of the process clarifier and upstream of the reverse osmosis unit. Additionally, the seawater reverse osmosis unit (SWRO) and associated reject tank have been removed from the treatment system. A pilot study was conducted by RLWTF representatives to evaluate if the volume of the regular reverse osmosis (RO) concentrate stream could be reduced using a SWRO unit. The pilot study has been completed and the hoses to the SWRO have been disconnected. Enclosure 1 highlights the aforementioned treatment system modifications. Enclosure 2 represents the modified treatment schematic to be in operation in late July or early August 2011.

Additionally, in April 2011, the RLWTF will initiate the use of magnesium hydroxide instead of calcium hydroxide in the facility's treatment system clarifier. Magnesium hydroxide raises the pH in

APR 1 2011

the clarifier and is the source of the hydroxide ion that precipitates with the ferric iron. RLWTF treatment operators would like to use magnesium hydroxide rather than calcium hydroxide because it has been proven to be more effective in silica removal in the clarifier, which then reduces silica fouling of the reverse osmosis (RO) membranes and the Hydrochem waste evaporator heat exchanger plates. The Material Safety Data Sheet (MSDS) for magnesium hydroxide is enclosed for your review (See Enclosure 3).

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality and RCRA Group (ENV-RCRA) if you have questions.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group (ENV-RCRA)
Los Alamos National Security, LLC

Sincerely,

Gene Turner

Gene Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

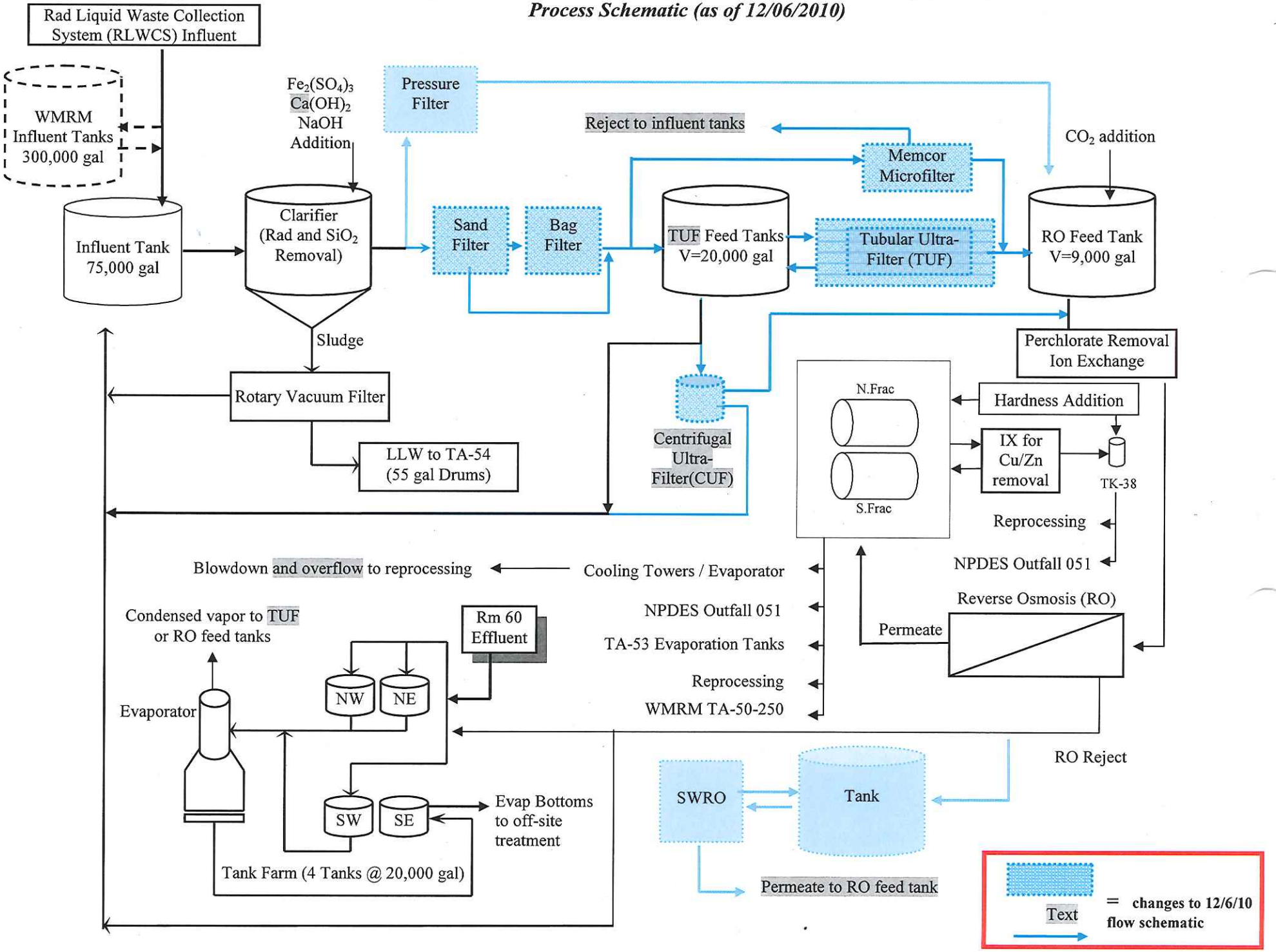
ARG:GT:MS/lm

Enclosure: a/s

Cy: Brent Larsen, USEPA/Region 6, Dallas, TX, w/enc.
Isaac Chen, USEPA/Region 6, Dallas, TX, w/enc.
Glenn Saums, NMED/SWQB, Santa Fe, NM, w/enc.
William Olson, NMED/GWQB, Santa Fe, NM, w/enc.
George Rael, LASO-EO, w/enc., A316
Steve Yanicak, LASO-GOV, w/enc., M894
Michael B. Mallory, PADOPS, w/o enc., AI02
Robert L. McQuinn, ADHHO, w/o enc., K778
Carl A. Beard, ADPMS, w/o enc., E585
J. Chris Cantwell, ADESHQ, w/o enc., K491
Robert Mason, TA55-DO, w/enc., E583
Hugh McGovern, TA-55-RLW, w/enc., E518
Pete Worland, TA-55-RLW, w/enc., E518
Mike Saladen, ENV-RCRA, w/enc., K490, (E-File)
Marc Bailey, ENV-RCRA, w/enc., K490, (E-File)
Bob Beers, ENV-RCRA, w/enc., K490, (E-File)
Cindy Blackwell, LC-LESH, w/o enc., A187
ENV-RCRA File, w/enc., K490
IRM-RMMSO, w/enc., Al50

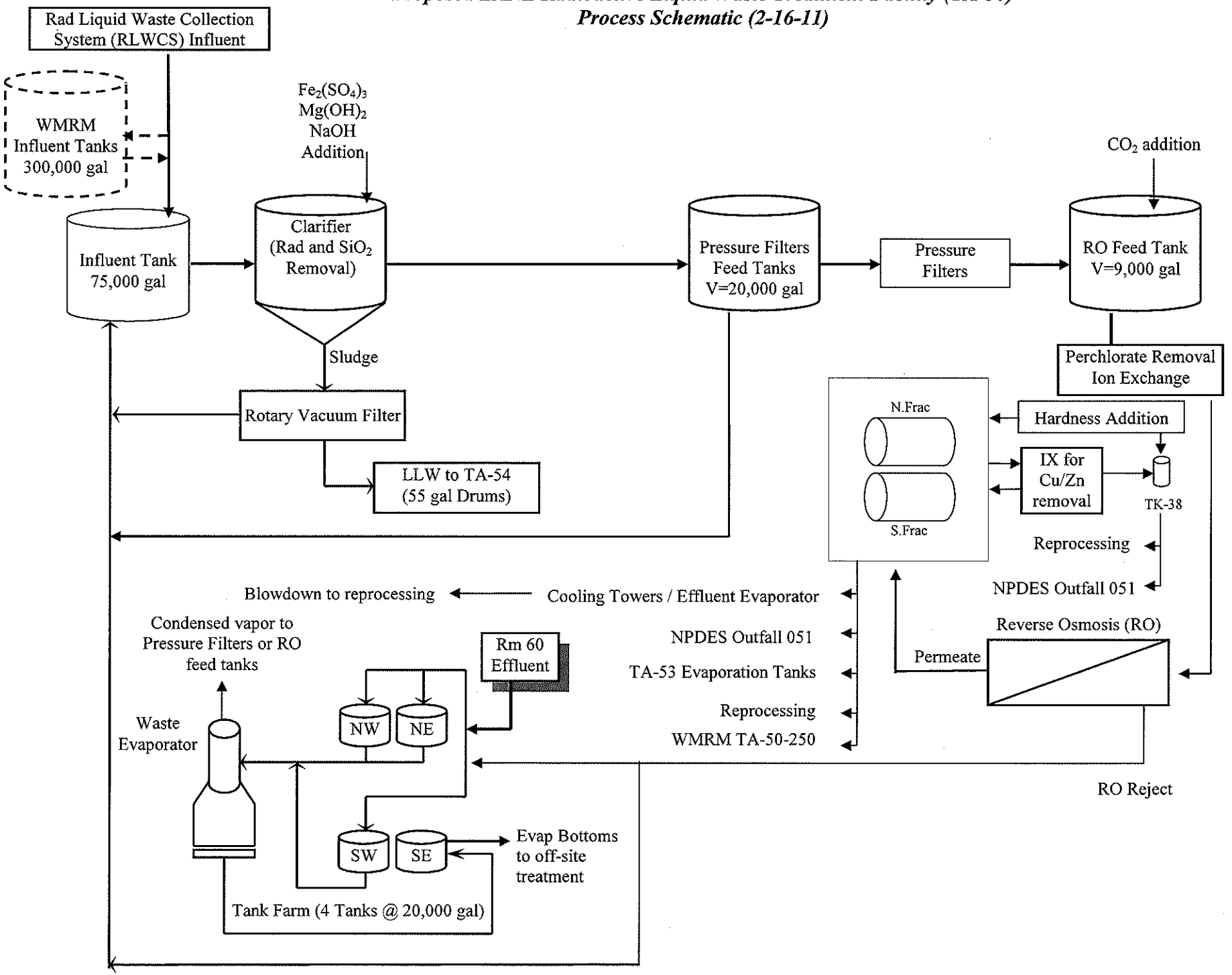
ENCLOSURE 1

Changes to LANL Radioactive Liquid Waste Treatment Facility (TA-50)
Process Schematic (as of 12/06/2010)



ENCLOSURE 2

Proposed LANL Radioactive Liquid Waste Treatment Facility (TA-50)
Process Schematic (2-16-11)



ENCLOSURE 3

May Hydrosol

Univar USA Inc Material Safety Data Sheet

MSDS No:	P14725V
Version No:	010 2006-08-18
Order No:	

Univar USA Inc., 17425 NE Union Hill Rd., Redmond WA 98052
(425) 889 3400

Emergency Assistance

For emergency assistance involving chemicals call
Chemtrec - (800) 424-9300

The Version Date and Number for this MSDS is : 08/18/2006 - #010

****
SECTION I PRODUCT IDENTIFICATION
****

PRODUCT NAME: MAGNESIUM HYDROXIDE SOLUTION

MSDS #: P14725V

DATE ISSUED: 04/17/2000

SUPERSEDES: 08/08/1997

ISSUED BY: 008497

REVIEWED DATE: 07/16/2004

This MSDS has been reviewed on 07/16/2004, and is current as of the DATE ISSUED above.

SECTION I Chemical Product And Company Identification

Product Name: Magnesium Hydroxide Solution
Hi-Chem Mag-50

CAS NUMBER: 1309-42-8

Distributed by:
Univar USA Inc.
17425 NE Union Hill Road
Redmond, WA 98052
425-889-3400

Section II Composition/Information On Ingredients

			Exposure Limits (TWAs) in Air		
Chemical Name	CAS Number	%	ACGIH TLV	OSHA PEL	STEL
Magnesium Hydroxide	1309-42-8	51-65	10 mg/m3 (total dust) 5 mg/m3 (respirable dust)	15 mg/m3 (total dust)	N/A

Section III Hazard Identification

ROUTES OF EXPOSURE: N/A

SUMMARY OF ACUTE HEALTH HAZARDS The product presents a very low health

risk. Magnesium hydroxide is a general purpose food additive. Dust generated from the dried product is classified as a nuisance dust.

INGESTION: Ingestion is unlikely. If ingested in sufficient quantity, may cause gastrointestinal disturbances. Symptoms may include irritation, nausea, vomiting, abdominal pain and diarrhea.

INHALATION: May irritate the respiratory tract on prolonged or repeated contact. May aggravate preexisting respiratory conditions.

SKIN: Repeated or prolonged contact may cause irritation

EYES: May irritate or injure eyes.

SUMMARY OF CHRONIC HEALTH HAZARDS: The excessive inhalation above (TLV) of mineral dust, over long periods of time, may cause industrial bronchitis, reduce breathing capacity, and lead to increased susceptibility to other lung disease.

SIGNS AND SYMPTOMS OF EXPOSURE: N/A
EFFECTS OF OVEREXPOSURE: N/A

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Dust from the dried product may aggravate pre-existing chronic lung conditions such as, but not limited to, bronchitis, emphysema, and asthma.

NOTES TO PHYSICIANS: N/A

Section IV First Aid Measures

INGESTION: Low toxicity. Give 1-2 glasses of water and seek immediate medical attention. Never give anything of mouth to an unconscious person. Leave decision to induce vomiting for medical personnel, since some particles may be aspirated into the lungs.

INHALATION: Move to fresh air; if discomfort persists, get medical attention.

SKIN: Wash with soap and water

EYES: Irrigate immediately with plenty of water. Obtain medical attention if necessary.

Section V Fire Fighting Measures

FLASH POINT: N/A AUTOIGNITION TEMPERATURE: N/A
LOWER EXPLOSIVE LIMIT: N/A UPPER EXPLOSIVE LIMIT: N/A
UNUSUAL FIRE AND EXPLOSION HAZARDS: N/A
EXTINGUISHING MEDIA: N/A
SPECIAL FIREFIGHTING PROCEDURES:
FIREFIGHTERS SHOULD WEAR NIOSH-APPROVED, POSITIVE PRESSURE, SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING WHEN APPROPRIATE.

Section VI Accidental Release Measures

Dike the spilled liquid, and either pump back into original container or cover with clay-type substance for absorption.

Section VII Handling and Storage

Store at ambient temperature. Prevent possible eye and skin contact by wearing protective clothing and equipment.

Section VIII Exposure Controls/Personal Protection

RESPIRATORY PROTECTION: Respirator approved by NIOSH/MSHA are adequate for contaminate concentrations encountered.
VENTILATION: N/A
PROTECTIVE CLOTHING: Gloves are recommended, rubber gloves re recommended when repeated or prolonged contact is likely.

EYE PROTECTION: Safety glassses are recommended.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: N/A
WORK/HYGIENIC PRACTICES: Avoid contact with the eyes and skin.

Section IX Physical and Chemical Properties

PHYSICAL STATE:	Milky liquid
MELTING POINT/RANGE:	N/A
pH:	10-11
BOILING POINT/RANGE:	212 DEG F, 100 DEG C
APPEARANCE/COLOR ODOR:	White - Off white, No odor
SOLUBILITY IN WATER:	NIL
SPECIFIC GRAVITY (Water = 1):	1.4-1.5
VAPOR DENSITY (Air = 1):	N/A
VAPOR PRESSURE (mmHg):	N/A
MOLECULAR WEIGHT:	N/A
% OF SOLUTION:	48-51 51-55 61-65
% VOLATILES:	49-52 45-49 35-39

Section X Stability and Reactivity

STABILITY: Stable HAZARDOUS POLYMERIZATION: Will Not Occur

CONDITIONS TO AVOID: N/A

MATERIALS TO AVOID: Acids and maleic anhydride Magnesium hydroxide is soluble in aqueous acids generating heat.

HAZARDOUS DECOMPOSITION PRODUCTS: HEAT AND STEAM

Section XI Toxicological Information

N/A

Section XII Ecological Information

N/A

Section XIII disposal Considerations

May be disposed of in a secured sanitary landfill. Disposal must be done in accordance with Local, State, and Federal regulations.

Section XIV Transport Information

DOT Proper Shipping Name: N/A
DOT Hazard Class/I.D. No: N/A

Section XV Regulatory Information

Reportable Quantity: N/A
NFPA Rating: Health - 1; Fire - 0; Reactivity - 0
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme
Carcinogenicity Lists: No NTP: No IARC Monograph: No OSHA Regulated: No

Section XVI Other information

SYNONYMS/ COMMON NAMES: Brucite
CHEMICAL FAMILY TYPE: Magnesium Hydroxide

Univar USA Inc Material Safety Data Sheet

For Additional Information contact MSDS Coordinator during business hours, Pacific time: (425) 889-3400

Notice

Univar USA Inc. ("Univar") expressly disclaims all express or implied warranties of merchantability and fitness for a particular purpose, with respect to the product or information provided herein, and shall under no circumstances be liable for incidental or consequential damages.

Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a product specification sheet and/or a certificate of analysis. These can be obtained from your local Univar sales office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar's control and therefore users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes and they assume all risks of their use, handling, and disposal of the product, or from the publication or use of, or reliance upon, information contained herein.

This information relates only to the product designated herein, and does not relate to its use in combination with any other material or in any other process

Los Alamos
NATIONAL LABORATORY
EST.1943

Environment, Safety, Health & Quality
P.O. Box 1663, K491
Los Alamos, New Mexico 87545
(505) 667-0666/FAX: (505) 667-5224

National Nuclear Security Administration
Los Alamos Site Office, A316
3747 West Jemez Road
Los Alamos, New Mexico 87545
(505) 667-5794/FAX (505) 667-5948

Date: February 23, 2011
Refer To: ENV-RCRA-11-0034
LAUR: 11-10030

Mr. Isaac Chen
U.S. Environmental Protection Agency, Region 6
Water Quality Protection Division
Permits and Technical Assistance Section (6WQ-PP)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Dear Mr. Chen:

SUBJECT: LOS ALAMOS NATIONAL LABORATORY, NPDES PERMIT NO. NM0028355, SUPPLEMENTAL INFORMATION FOR NOTICE OF PLANNED CHANGE FOR THE ADDITION OF HARDNESS TO OUTFALL 051 EFFLUENT

Per your request, additional information is being provided regarding the Notice of Planned Change sent to the U. S. Environmental Protection Agency's Region 6 in December 2010 (reference ENV-RCRA-10-239) concerning plans to restore hardness to the Radioactive Liquid Waste Treatment Facility (RLWTF) effluent waters. The enclosed report is an evaluation of how hardness contributes to the whole effluent toxicity of Outfall 051 effluent. This report was prepared by Pacific EcoRisk in Fairfield, California (See Enclosure 1).

This information is provided as a follow-up to e-mail correspondence sent to you from Mike Saladen on December 23, 2010. Los Alamos National Security, Inc. (LANS) and National Nuclear Security Administration (NNSA) representatives will be scheduling a visit to your office in early March 2011 to continue this discussion.

APR 14 2011

Please contact Marc Bailey at (505) 665-8135 or Mike Saladen at (505) 665-6085 of the Water Quality and RCRA Group (ENV-RCRA) if you have questions or need additional information.

Sincerely,

A R Grieggs

Anthony R. Grieggs
Group Leader
Water Quality & RCRA Group (ENV-RCRA)
Los Alamos National Security, LLC

Sincerely,

Gene Turner

Gene Turner
Environmental Permitting Manager
Environmental Projects Office
Los Alamos Site Office
National Nuclear Security Administration

ARG:GET:MB/lm

Enclosure: a/s

Cy: Brent Larsen, USEPA/Region 6, Dallas, TX, w/enc.
Mary Simmons, USEPA/Region 6, Dallas, TX, w/enc.
Glenn Saums, NMED/SWQB, Santa Fe, NM, w/enc.
William Olson, NMED/GWQB, Santa Fe, NM, w/enc.
Steve Yanicak, LASO-GOV, w/enc., M894
Michael Mallory, PADOPS, w/o enc., A102
J. Chris Cantwell, ADESHQ, w/o enc., K491
Hugh McGovern, TA-55-RLW, w/enc., E518
Pete Worland, TA-55-RLW, w/enc., E518
Mike Saladen, ENV-RCRA, w/enc., K490, (E-File)
Marc Bailey, ENV-RCRA, w/enc., K490, (E-File)
Bob Beers, ENV-RCRA, w/enc., K490, (E-File)
Randy Johnson, ENV-ES, w/enc., E500
Cindy Blackwell, LC-LESH, w/o enc., A187
ENV-RCRA, File, w/enc., K490
IRM-RMMSO, w/enc., Al50

ENCLOSURE 1

An Evaluation of the Role of "Hardness" in the Amelioration and/or Exacerbation of Los Alamos National Laboratory Outfall 051 Effluent Toxicity

Prepared For:

Los Alamos National Laboratory
TA-3 SM-271 Drop Point 02U
Los Alamos, NM 87545

Prepared By:

Pacific EcoRisk
2250 Cordelia Road
Fairfield, CA 94534

February 2011
Report Revised February 23, 2011

PACIFIC ECORISK
ENVIRONMENTAL CONSULTING & TESTING

1. INTRODUCTION

The NPDES Permit No. NM0028355 issued to the National Nuclear Security Administration (NNSA) and Los Alamos National Security, LLC (LANS) for the Los Alamos National Laboratory (LANL) requires the permittee(s) to perform acute and/or chronic aquatic toxicity bioassays for several discharge outfalls throughout the Laboratory. Pacific EcoRisk, Inc. (PER) has been performing acute toxicity testing on LANL's Radioactive Liquid Waste Treatment Facility (RLWTF) Outfall 051 effluent using the freshwater crustacean *Daphnia pulex* since 2007. During this time sporadic occurrences of toxicity have been observed. Examination of the basic water quality characteristics of the 051 effluent suggests that the hardness of the effluent is playing a role in the observed toxicity.

1.1 Hardness in LANL Surface Water and Groundwater

Hardness is a natural component of water and is defined as the concentration of multivalent cations (mainly divalent cations). The primary hardness cations are generally calcium (Ca^{2+}) and magnesium (Mg^{2+}). The U.S. Geological Survey reports that some of the United States' hardest surface waters are found in New Mexico, Arizona, and Texas. Interestingly, while the Los Alamos region is surrounded by surface waters categorized as "very hard" (> 181 mg/L), it can be considered an "island" of surface water hardnesses typically in the "moderately hard"(60-120 mg/L) and "hard" (121-180 mg/L) range (http://water.usgs.gov/owq/hardness-alkalinity.html#map). This is consistent with the surface water hardnesses ranging from 52-159 mg/L that were measured for LANL ambient surface waters that were previously received and analyzed (Table 1) at the PER laboratory (PER 2005).

Table 1. Surface water quality characteristics of the Los Alamos ambient water samples.

Sample ID	Sample Date	Temp (°C)	pH	D.O. (mg/L)	Alkalinity (mg/L)	Hardness (mg/L)	Conductivity (μS/cm)	Total Ammonia (mg/L N)
CAMO-05-61170	7/26/05	10.8	7.72	10.7	119	111	357	<1.0
CAMO-05-61172	7/26/05	9.7	7.13	10.2	170	159	422	<1.0
CAMO-05-61174	7/26/05	7.9	7.24	11.3	138	117	423	<1.0
CAMO-05-61176	7/26/05	6.7	7.66	12.2	130	90	483	<1.0
CALA-05-61185	7/26/05	6.9	7.64	10.9	64	93	199	<1.0
CAMO-05-61166	8/18/05	6.0	7.05	10.2	90	99	244	<1.0
CAMO-05-61178	8/18/05	8.9	7.33	9.8	78	52	265	<1.0
CAMO-05-61180	8/18/05	8.9	7.80	11.1	92	82	271	<1.0

Data from PER 2005; water quality characteristics were measured at the time of sample log-in at the testing lab.

However, the source of water used at LANL is not surface water, but rather is domestic "tapwater" provided by Los Alamos County which pumps high-quality groundwater from the

local aquifer via three water supply well fields (Otowi, Pajarito and Guaje), each of which has different hardness characteristics (Environmental Surveillance at Los Alamos during 2000, LA-13861-ENV):

- The Otowi field - The water hardness ranges from 63-89 mg/L (as $CaCO_3$);
  - calcium concentrations range from 20-22 mg/L;
  - magnesium concentrations range from 3-8 mg/L;
- The Pajarito field – The water hardness ranges from 42-96 mg/L;
  - calcium concentrations range from 11-27 mg/L;
  - magnesium concentrations range from 3-8 mg/L;
- The Guaje field - The water hardness ranges from 29 to 56 mg/L;
  - calcium concentrations range from 11-17 mg/L;
  - magnesium concentrations range from 1-3 mg/L.

Note – Due to the unique hydrogeology of the aquifer that serves Los Alamos, its water hardness is comprised almost completely by calcium and magnesium.

This "tapwater" is used in LANL's radiological and nuclear facilities in a variety of applications. Wastewater from these facilities is collected and routed via a collection system to the influent tank at the RLWTF for treatment. Wastewater fed from this influent tank to the RLWTF treatment process is termed "RAW" influent. The treated water discharged from the RLWTF treatment process is termed "FINAL" effluent. The "RAW" influent to the RLWTF starts out with a hardness of approximately 40-45 mg/L (Table 2). However, the RLWTF's various wastewater treatment processes have the indirect effect of reducing the hardness in the Outfall 051 "FINAL" effluent to approximately 1-3 mg/L (range = 0.2-12 mg/L in 2008-09).

Table 2. Hardness-related water quality characteristics in LANL "Tapwater", "RAW" RLWTF influent, and Outfall 051 "FINAL" effluent

Water Quality Parameter	1994-1997[a]	2008[b]		2009[b]	
	"Tapwater"	"RAW" Influent	"FINAL" Effluent	"RAW" Influent	"FINAL" Effluent
Hardness (mg/L as $CaCO_3$)	48.9	41.8	1.47	44.6	2.7
Calcium (mg/L)	13	11.4	0.31	12.0	0.40
Magnesium (mg/L)	4	3.2	0.17	3.6	0.41

a - A Mathematical Model (AMIGA) of Solution Chemistry and Silica Solubility in High Silica Water at LANL, V. P. Worland, May 1997.

b - Data from 2008 and 2009 Annual Reports for the LANL Rad Liquid Waste Treatment Facility.

1.2 Importance of Hardness Ca^{2+} and Mg^{2+} Ions in Biological Systems

While the RLWTF's wastewater treatment processes effectively reduce the concentrations of many effluent contaminants (e.g., metals, etc.), the concomitant reduction of Ca^{2+} and Mg^{2+} concentrations could be problematic in that all organisms (i.e., plants, invertebrates, and vertebrates) require Ca^{2+} and Mg^{2+} in order to exist. These two elements are considered "the

most important and abundant dissolved solids in freshwater" (Rand et al., 1995). There are numerous critical biological processes that are dependent on Ca^{2+} in order to function. It is essential for metabolic processes in all living organisms (Goldman and Horne 1983), a regulator of cell permeability (Ricklefs 1979), the main skeletal component of many animals and some plants (Goldman and Horne 1983). Ca^{2+} release is the trigger for many cellular events including muscle contraction (Lehninger et al., 1993). Mg^{2+}, which has a similar water chemistry to Ca^{2+}, is vital for energy transfer in every cell since it catalyzes the change from ATP to ADP (Goldman and Horne 1983). Plants also require Mg^{2+} to form the active center of the primary photosynthetic pigment, chlorophyll *a* (Goldman and Horne 1983).

A summary of the biological functions of calcium and magnesium is presented in Table 3.

Table 3: Roles of calcium and magnesium in critical biological functions

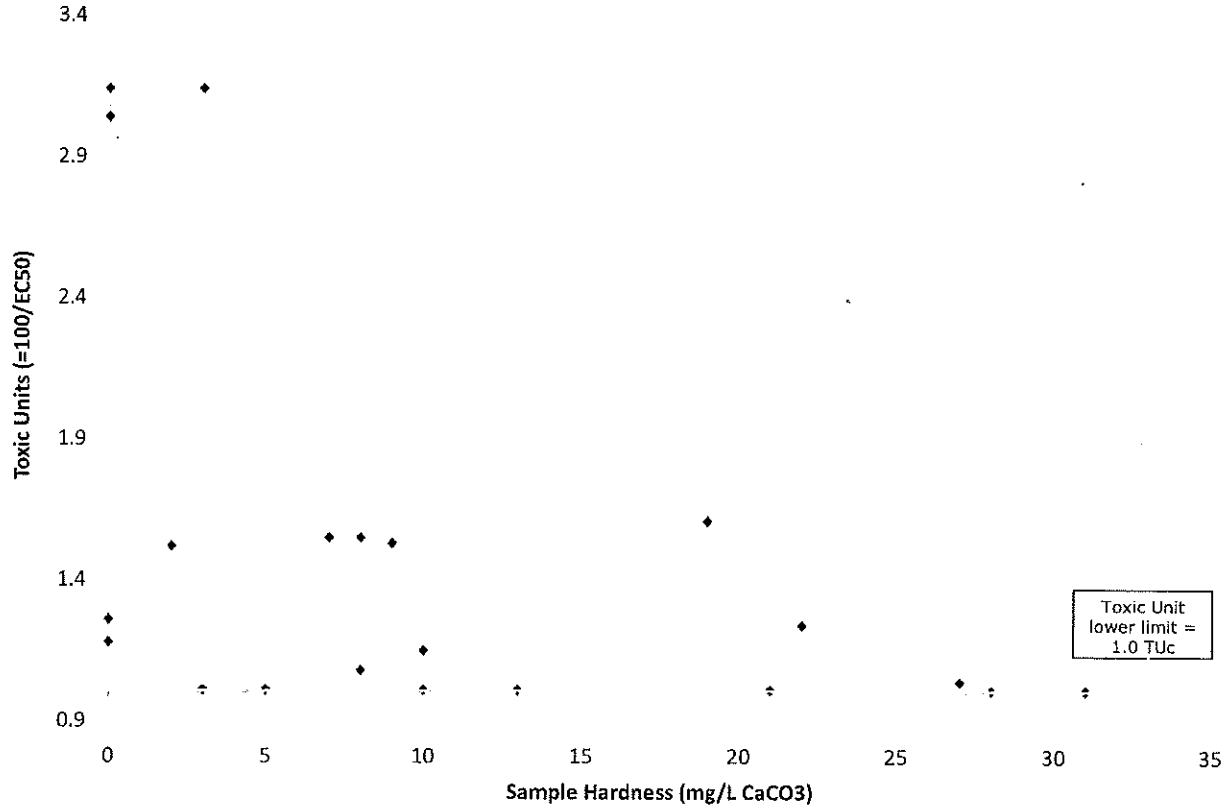
Micronutrient	Biological Function
Calcium (Ca^{2+})	Regulator of cell permeability Structural component of bone and skeletal structures Antagonistic influence on the uptake of metals Essential for metabolic processes in all living organisms Controlling factor in muscle contraction
Magnesium (Mg^{2+})	Structural component of chlorophyll Involved in function of many enzymes Vital for cell metabolism as the catalyst for transformation of ATP to ADP.

1.3 Low Hardness and Toxicity of RLWTF Outfall 051 Effluent

The roles of calcium and magnesium as essential to organism health appears to be reflected in the results of the 24 acute toxicity tests of the Outfall 051 effluent that PER has performed since 2007: when hardness levels are extremely low, there is generally an increase in the apparent toxicity of the effluent, and when hardness levels are >25 mg/L, virtually no toxicity is observed (Table 4 and Figure 1).

While there seems to be a correlation between extreme low hardness levels and increased toxicity, it is difficult to ascribe that completely to calcium and magnesium deficiencies. While the essential role for Ca^{2+} and Mg^{2+} in organism health is well known, few studies on adverse effects of extreme low hardness on aquatic organisms, and particularly daphnids, have been reported. Cowgill and Milazzo (1991) reported that daphnid (*Daphnia magna* and *Ceriodaphnia dubia*) reproduction declined below hardness levels of 72 mg/L, with 'total number of offspring' EC_{50}'s of 5 mg/L and 38 mg/L, respectively (in this context, EC_{50} is the hardness concentration predicted to have a 50% effect on the organisms). Cowgill and Milazzo also reported that *C. dubia* exhibited signs of stress when water hardness was below 9 mg/L.

Figure 1. Effects of Outfall 051 Hardness on Acute Toxicity



Note – Toxic Units (TU) are standard measures of the magnitude of toxicity, where TU > 1 indicates the presence of toxicity, with the magnitude of the toxicity increasing as the TU increases.

Lasier et al. (2006) similarly reported that *C. dubia* cultured in higher hardness waters (~100 mg/L) suffered reduced reproduction when exposed to low-hardness waters (40-50 mg/L); no such effects were observed for low-hardness organisms transferred to high-hardness waters. This suggests that the low hardness of the Outfall 051 effluent could cause adverse effects as it dilutes and lowers the hardness of any downstream ambient waters.

The Outfall 051 effluent is discharged into the Mortandad Canyon "receiving water", which is an ephemeral stream. Generally, the effluent infiltrates below the ground surface within 100 yards downstream of the outfall, although it may reach as far as 1-2 miles downstream before complete infiltration following significant storm events. However, as a precautionary 'worst case scenario' approach, it is responsible to be protective of the downstream aquatic ecosystems that do have established populations of aquatic organisms. The scientific studies cited above suggest that the reduction (and in some cases complete removal) of the hardness that is present in the "tapwater" and "RAW" influent to the low levels observed for the Outfall 051 effluent (and hence, in ambient waters downstream of the Outfall 051 effluent discharge) could directly or indirectly affect downstream receiving waters.

Table 4: Hardness levels and acute toxicity of LANL Outfall 051 samples (2007-2010)

Sample Collection Date	Sample Hardness (mg/L $CaCO_3$)	NOEC (% Effluent)	EC_{50} (% Effluent)	Toxic Units ($100/EC_{50}$)
1/23/07	5	100	>100	<1
9/27/07	9	56	65.9	1.52
10/30/07	8	56	65.0	1.54
12/12/07	2	56	66.2	1.51
12/19/07	19	56	62.4	1.60
2/25/08	27	100	96.7	1.03
6/25/08	8	75	93.4	1.07
8/6/08	3	100	>100	<1
11/17/08	7	56	64.8	1.54
2/10/09	10	100	>100	<1
4/16/09	13	100	>100	<1
7/9/09	22	75	77.7	1.23
7/28/09	31	100	>100	<1
12/1/09	0	<32[a]	<32[a]	>3.13
1/4/10	0	<32	33	1.33
1/11/10	0	75	79.7	1.25
1/25/10	0	75	85.5	1.17
3/8/10	28	100	>100	<1
3/22/10	10	75	87.6	1.14
4/26/10	3	<32[a]	<32[a]	>3.13
6/8/10	21	100	>100	<1
7/12/10	0	<32	<32	>3.13
7/19/10	0	<32[a]	<32[a]	>3.13
11/18/10	31	100	>100	<1

a – There was complete mortality at all effluent concentrations.

Based upon this information, it is recommended that the hardness of the Outfall 051 effluent be restored to the hardness levels originally present in the "RAW" water prior to discharge. It is worth noting that this is recognized by regulatory agencies in their own guidelines for the performance of Toxicity Identification Evaluations (TIEs): California regulatory guidelines state that after performing ion-exchange treatment, "essential" ions Ca^{2+} and Mg^{2+} be added back to the effluent (Connor and Deanovic 1991).

1.4 Interaction Between Hardness and Contaminant Toxicity

The scientific literature clearly indicates the essentiality of Ca^{2+} and Mg^{2+} in ambient waters in order to maintain the health of aquatic organisms. The observation of toxicity at extreme low

hardness levels may also be due in part to the general antagonistic effect of hardness (and particularly Ca^{2+}) on the toxicity of contaminants, and metals in particular. For instance, numerous studies have reported that hardness is protective of metals toxicity to the Outfall 051 test organism *Daphnia pulex* (or to closely-related *Daphnia magna)*, typically with Ca^{2+} having a greater protective effect than Mg^{2+} (Santore et al. 2001; deSchampheleare and Janssen 2002; Heijerick et al., 2002; Naddy et al. 2002; Kozlova et al. 2008; Clifford and McGeer 2009, 2010). In fact, the protective effect of hardness on metals toxicity to a wide variety of aquatic organisms is so well established that contemporary water quality criteria for metals generally are normalized to hardness levels of waters.

Again, the restoration of the hardness levels to the LANL effluent is recommended as a protective measure against potential contaminant toxicity to downstream aquatic organisms and to the *Daphnia pulex* organisms used in the acute toxicity tests of the Outfall 051 effluent.

2. SUMMARY AND CONCLUSIONS

The water used at LANL is a groundwater and has a hardness that is typically ~40-50 mg/L. However, after application of the various wastewater treatment processes at the RLWTF, the hardness of the Outfall 051 effluent has been reduced to levels as low as ~1 mg/L (the annual mean concentrations were approximately 1-3 mg/L, and ranged from 0.2-12 mg/L in 2008-09). This extreme low hardness is of potential concern as the hardness ions Ca^{2+} and Mg^{2+} are essential to maintain the health of aquatic organisms.

The reduction of the concentrations of these essential ions may be reflected in the observation of sporadic acute toxicity of the Outfall 051 effluent, particularly when the hardness is reduced to extremely low levels (e.g., to non-measurable concentrations). In addition, it can be expected that if present, the toxicity of contaminants, and in particular metals such as copper and zinc, will be increased at the extremely low hardness levels.

On that basis, it is highly recommended that LANL consider implementation of measures to restore the hardness of the effluent to the original source water levels. This restoration of hardness is also supported by the fact that regulatory agency guidelines similarly call for the restoration of water hardness levels to those concentrations existing prior to the application of treatment processes that remove Ca^{2+} and Mg^{2+}. In the interim, it is recommended that the effluent samples used for acute toxicity testing with *D. pulex* be amended with the hardness ions Ca^{2+} and Mg^{2+} to restore the hardness to the original "RAW" influent conditions.

3. REFERENCES

Clifford M, McGeer JC (2009) Development of a biotic ligand model for the acute toxicity of zinc to *Daphnia pulex* in soft waters. Aquatic Toxicology 91(1):26-32.

Clifford M, McGeer JC (2010) Development of a biotic ligand model to predict the acute toxicity of cadmium to *Daphnia pulex*. Aquatic Toxicology 98(1):1-7.

Connor V, Deanovic L (1991) A Laboratory Manual for the Preparation and Use of Ion Exchange Resins to Determine the Concentration and Biotoxicity of Dissolved Trace Metals in Freshwater Samples. Central Valley Regional Water Quality Control Board, Sacramento, CA.

Cowgill UM, Milazzo DP (1991) The sensitivity of two cladocerans to water quality variables: Salinity <467 mg NaCl/L and hardness <200 mg $CaCO_3$/L. Archives of Environmental Contamination and Toxicology 21:218-223.

Davies PH (1995) Factors Controlling Nonpoint Source Impacts. Pages 53-64 in: Herricks EE Jenkins JR (eds) *Stormwater Runoff and Receiving Systems: Impact Monitoring and Assessment*. CRC Press, Inc. Lewis Publishers, Boca Raton, FL.

deSchampheleare KAC, Janssen CR (2002) A biotic ligand model predicting acute copper toxicity to *Daphnia magna*: The effects of calcium, magnesium, sodium, potassium, and pH. Environmental Science and technology 36(1):48-54.

Goldman CR, Horne AJ (1983) *Limnology*. McGraw-Hill, Inc., New York, NY.

Heijerick DG, deSchampheleare KAC, Janssen CR (2002) Predicting acute zinc toxicity for daphnia magna as a function of key water chemistry characteristics: Development and validation of a biotic ligand model. Environmental Toxicology and Chemistry 21(6):1309-1315.

Kozlova T, Wood CM, McGeer JC (2008) The effect of water chemistry on the acute toxicity of nickel to the cladoceran *Daphnia pulex* and the development of a biotic ligand model. Aquatic Toxicology 91(3):221-228.

Lasier PJ, Winger PV, Hardin IR (2006) Effects of hardness and alkalinity in culture and test waters on reproduction of *Ceriodaphnia dubia*. Environmental Toxicology and Chemistry 25(10):2781-2786.

Lehninger AL, Nelson DL, Cox MM (1993) *Principles of Biochemistry: Second Edition*. Worth Publishers, Inc. New York, NY.

Mayer Jr FL, Marking LL, Bills TD, Howe GE (1994) Physiochemical factors Affecting Toxicity in Freshwater: Hardness, pH and Temperature. Pages 5-22 in: Hamelink JL, Landrum PF, Bergman HL, Benson WH (eds) *Bioavailability: Physical, Chemical and Biological Interactions*. CRC Press, Inc., Lewis Publishers, Boca Raton, FL.

Naddy RB, Stubblefield WA, May JR, Tucker SA, Hockett JR (2002) The effect of calcium and magnesium ratios on the toxicity of copper to five aquatic species in freshwater. Environmental Toxicology and Chemistry 21(2):347-352.

PER (2005) An Evaluation of the Toxicity of Los Alamos National Laboratory Ambient Waters to *Selenastrum capricornutum*. Report prepared for LANL. Pacific EcoRisk, Fairfield, CA.

Rand GM, Wells PG, McCarty LS (1995) Introduction to Aquatic Toxicology. Pages 3-66 in: Rand GM (ed) *Fundamentals of Aquatic Toxicology: Effects, Environmental Fate, and Risk Assessment, Second Edition*. Taylor and Francis, Bristol, PA.

Ricklefs RE (1979) *Ecology*. Chiron Press, Inc., New York, NY.

Santore RC, DiToro DM, Paquin PR, Allen HE, Meyer JS (2001) Biotic ligand model of the acute toxicity of metals. 2. Application to acute copper toxicity in freshwater fish and *Daphnia*. Environmental Toxicology and Chemistry 20(10):2397-2402.